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Some Remarks on Foot-and-Mouth Disease.*

By J. M. L. Penhale, M.R.C.V.S., Divisional Inspector, Ministry of Agriculture.

I have been requested to speak to you for a few minutes this afternoon on the subject of foot-and-mouth disease, and as the time at our disposal is limited, I propose confining my remarks to points which I consider will be of special interest to the veterinary practitioner.

There is no need to stress the importance of the subject, and although Devon and Cornwall have, during recent years, escaped any serious outbreak of the disease, its erratic appearance in other parts proves the necessity for a constant look out by all veterinary surgeons, in order that any suspicious case may be reported at the earliest possible moment.

Foot-and-mouth disease may be defined as an acute contagious fever of cloven-footed animals, characterised by the appearance of vesicles on certain parts of the mucous membranes and skin. It is caused by a micro-organism which belongs to a group of ultra-visible and filterable viruses, which means that these viruses are so minute that they cannot be demonstrated by the most powerful microscope, and that they will pass unaltered through a filter which will arrest ordinary bacteria.

It was the first animal disease in which the cause was proved to be filterable, and it is regarded as the most contagious of all diseases.

Animals susceptible. Cattle, pigs, sheep, and goats are readily susceptible to natural infection, and the disease spreads rapidly amongst these animals. Deer and camels may also become infected, and cases have been recorded in horses, dogs and cats.

Guinea pigs can be readily infected by inoculation of virulent material in a particular way, and this has proved of great advantage to research workers, who have been able to use these animals for experimental purposes. Rats, rabbits, and hedgehogs have also been experimentally infected, but fowls and small birds appear to be immune.

Although evidently possessed of a high degree of resistance, human beings may contract the disease.

Symptoms.

In cattle, the disease commences with a fever—temperature often 106°F. and at this stage the animal is dull and disinclined to feed. If food is taken it is chewed carefully (indicating some soreness in the mouth) and frequently it is "quidded" and dropped.

This stage may pass unnoticed by the owner, and his attention is probably first attracted by the appearance of sudden lameness or salivation, and these symptoms, especially if exhibited by more than one animal, should be regarded with the greatest suspicion. When moved, the animal appears generally stiff and uneasy, and it frequently lifts and shakes the feet in turn, occasionally kicking out as if to remove some foreign object which is causing pain. Strings of saliva will now be noticed hanging from the mouth, and this is accompanied by a peculiar sucking or smacking sound which is a constant symptom.

As the disease progresses the animal is disinclined to move, the coat is stark, condition is rapidly lost, and in dairy cows there is a fall in the milk yield.

With the formation and rupture of the vesicles the temperature drops, and the animal moves more readily and with fewer signs of pain.

Salivation is much less marked in pigs and sheep, the outstanding symptom in these animals being acute lameness with constitutional disturbance. An affected sheep, if driven, usually lags behind the remainder of the flock, and walks with a decided "lame all round" action. Pregnant ewes may abort.

Pigs usually refuse to rise unless forced, and they then show their displeasure and acute pain by loud squeals. Lameness is severe in these animals, and in the later stages of the disease the claws are frequently shed.

Lesions.—The lesions consist of vesicles which are found on the mucous membrane of the mouth, on the feet and teats, and occasionally inside the vagina and on the muzzle.

Mouth Lesions. In cattle they may be found on any part of the tongue, but the upper surface of the free portion is the common site. The gums, especially under the upper lip, may also be affected, and less frequently the palate and inner surface of the cheeks. The vesicles are often up to the size of a walnut and occasionally on the dorsum of the tongue may be as large as a small egg. Unless quite recently formed these vesicles are easily ruptured, when a clear fluid escapes, and an ulcerated area with a red raw surface and ragged edges is left.

In sheep, mouth lesions are not constant, but when present are usually confined to the dental pad, but may also appear on the inner side of the lips.

In pigs, vesicles are generally present on the snout, and in young swine small lesions may also be found on the tongue.

Feet lesions, which are similar in character to those found in the mouth, may be present around the coronary band, and in the interdigital space, especially at the bulb of the heel and well forward between the toes.

Pigs are usually affected on the ball of the foot and at the base of the false digits.

Lesions on the teats are fairly common, and in swine may sometimes be found on the skin of the body.

Very young animals affected with foot-and-mouth disease may die from acute gastro-enteritis without showing any definite eruptions.

Period of Incubation. The period after natural infection is usually from two to seven days, and occasionally up to ten or eleven days, but the shorter time is the more common.

* Presented to the Western Counties Division at Plymouth, 23rd November, 1927.

Experiments carried out by the Foot-and-Mouth Disease Research Committee show that after experimental infection mouth lesions do not usually appear until after seventy-two hours from time of inoculation. The shortest time recorded (one animal only) is about twenty hours, and the longest period was 212 hours.

In guinea pigs inoculated into the pad of the hind foot, vesicles develop at this site in 12 to 24 hours, and generalisation occurs on the second or third day.

INFECTIVITY OF THE VIRUS AND SPREAD OF THE DISEASE.

The blood is always infective during the early febrile stages of the disease, and although the clinical symptoms at this period are not so evident, the disease is now in its most infectious stage. Experiments carried out by LEBAILLY, a French scientist, show that infection invariably occurs if contact takes place during the period from the initial rise in temperature until the rupture of the vesicles, and VALLÉE and CARRÉ state that if an inoculated animal is placed in contact with another susceptible animal, but is removed as soon as the temperature reaction appears, infection will nevertheless take place.

The risk of carrying infection after handling an animal affected in the early stages is therefore very real, and the virulence of the virus will be realised from experiments carried out by the Foot-and-Mouth Disease Research Committee, in which several samples of vesicular fluid from guinea pigs have proved infective after diluting one to ten million.

Important work has also been done by this Committee on the survival of the virus under varying conditions, and the following results are of great interest from the point of view of the spread of infection.

(1) Virus present in the flesh of a diseased animal becomes inert twenty-four hours after slaughter.
(2) In the blood it may remain active for thirty to forty days after slaughter.
(3) In bone marrow the virus may remain active for seventy-six days after slaughter.
(4) Virus kept in the "cold room" has proved active after several months' storage, and one sample has survived for at least 433 days.
(5) On hay the virus was active after eight to fifteen weeks (not completed).
(6) Stored on bran the virus was active after eight to twenty weeks (not completed).
(7) On cows' hair the virus was active after four weeks, but not after six weeks.
(8) On sand the virus was active after two weeks, but not after three weeks.
(9) Mixed with (salt) butter the virus survived for two weeks, but was not active after three weeks.
(10) Defibrinated blood was inactive after heating in a water bath for twenty minutes at 55°C., and diluted filtered virus does not survive for more than four or five days if incubated at 37°C.

A steady low temperature favours the survival of the virus, which is adversely affected by heat or light.

Under natural conditions the disease spreads rapidly from animal to animal by contact, and it may also be carried to different parts of the same farm and for long distances by the movements of persons, animals and things.

A great danger from this point of view is the movement of stock in the incubative or early infective stage of the disease, and a number of such animals exposed and sold in a market and distributed in small lots may cause very serious damage, and this danger throws a great responsibility on veterinary surgeons carrying out market inspections.

Persons, horses, dogs, cats, birds, wild animals, milk, feeding stuffs, carts, sacks, manure, etc., may act as mechanical carriers and it has been suggested that human beings affected with the disease may convey it to animals.

Before proceeding to a suspected case, a veterinary surgeon should provide himself with special clothing. He will probably be able to change into an old suit of clothes and wear an old hat or cap. A waterproof coat and rubber boots should be worn, whilst on the suspected premises, and a supply of disinfectant should be available.

At the commencement of the examination the suspected animal may with advantage be carefully observed for a few moments without interference, and the owner should be closely questioned regarding the symptoms which have been noticed.

Before handling, it will be necessary to have the animal placed under proper restraint and in a position where a good light can be obtained. If the examination takes place after daylight an electric torch will be found of service, and if not too large this can be inserted well into the mouth to show up any part of the buccal cavity.

If the suspected animal is at pasture, it may be advisable, unless a shed or convenient catching place is available, to erect a temporary stockade or pen, as it is important that a beast is not allowed to break any fences or get contact with other stock. A cloth will be found of service to assist a grip of the tongue, and it will often be necessary to wash the feet in order to make a satisfactory examination.

If disease is found to exist or is suspected, the animals should be isolated and put under cover, if this can be done without any road movement and will not bring them near other stock.

In the case of a flock of sheep or a number of cattle at pasture, when confinement is not possible, the animals should be shut away from any fields adjoining a road, if this can be done without endangering other stock.

The movement of animals to or from the premises should be stopped, and dogs, cats, and poultry should all be confined.

A separate attendant should be provided for the suspected animals and this man should wear a special overall or smock and boots, which must not be brought away from the infected field or building. This attendant and any other person who has been amongst the suspected animals should be instructed regarding disinfection, and the owner and his employees warned against visiting other stockowners.

A bucket of disinfectant, with a cloth or brush, should be placed at the entrance to the infected field or shed, and also at the farm gate, where a wide mat of hay or sacks should be laid, and this must be kept well soaked with disinfectant.

Before leaving the premises a very thorough personal disinfection must be carried out. The coat and hat, thermometer, torch and any other thing used about the

animal must be well washed with disinfectant—special attention being paid to the inner side of the cuffs of the coat—or preferably the latter may be immersed in the fluid. All manure must be removed from the boots, which afterwards should be washed with disinfectant, and finally the hands (including the finger nails) should be thoroughly cleaned and disinfected. A complete change of all clothing should later be made, before visiting any other stock.

ORDERS.

I now propose calling your attention to certain parts of certain Orders which affect the veterinary practitioner or the local authority veterinary inspector.

(*a*) *Animals* (*Notification of Disease*) *Order of* 1919. Under this order a veterinary surgeon or veterinary practitioner who in the course of his practice is employed to examine any animal, or the carcase of any animal, and is of opinion that the animal is diseased, or was diseased when it died or was slaughtered, or suspects the existence of disease therein, shall with all practicable speed give notice of the existence or suspected existence of disease to an inspector of the local authority, and also to a constable of the police force for the police area in which the animal or carcase is, or was at the time of its death. The veterinary surgeon is entitled to receive, from the local authority, a fee of 2/6 for each notification.

(*b*) *Foot and Mouth Disease* (*Amendment*) *Order of* 1925 (*No.* 2). Under this order a local authority enquiring into the suspected existence of foot-and-mouth disease shall obtain the assistance or advice of a veterinary inspector, who shall, before entering any premises in which foot-and-mouth disease exists or is suspected to exist, put on overall clothing and boots which are disinfectable, and shall, on leaving such premises thoroughly disinfect his hands, overall clothing, and boots. The required overall clothing and boots shall be supplied to every such person by the local authority.

(*c*) *Foot-and-Mouth Disease* (*Emergency Restrictions*) *Order of* 1925. Under this order in any case in which a veterinary inspector is of opinion that an animal or carcase is affected with foot-and-mouth disease, or that there are reasonable grounds for suspecting its existence, he is required to sign a certificate to that effect in the form prescribed in the order, and to send the same to the Ministry, and also to notify the issue of the certificate by telegraph or other speedy means to :—

(1) The chief constable of any police area within five miles.

(2) The clerk of any local authority within five miles.

(3) The stationmaster of the nearest railway station.

Where such a certificate has been signed the movement of animals within a radius of five miles of the outbreak or suspected outbreak is unlawful. The restrictions imposed by this order remain in operation for two clear days after the certificate is signed, provided that the operation of the restrictions may be withdrawn or extended by an inspector of the Ministry.

In effect, this order means that if the veterinary inspector of the local authority is unable to satisfy himself that foot-and-mouth does not exist, he is required to sign a certificate stating that he suspects disease, and the "standstill" order is then automatically applied, and the premises will be placed under police supervision until the arrival of the Ministry's inspector.

In all reported cases the final diagnosis rests with the Ministry, whether or not the local authority veterinary inspector suspects disease when called in on behalf of the local authority. If the suspicion is not confirmed, any restrictions imposed will be withdrawn, but if disease is found to exist the Foot-and-Mouth Disease (Infected Areas Order) is applied, usually to an area of approximately fifteen miles around the infected premises.

Restocking of an infected farm, to a limited extent, is usually allowed eight weeks after the date of completion of slaughter or six weeks after the date of completion of disinfection—whichever is the earlier. Normally, the owner is then allowed to move on to his farm, by licence, up to fifty per cent. of the number slaughtered, and a veterinary inspection of this stock is made three weeks after the restocking commences, when the premises are freed if no evidence of disease is found.

No difficulty should be experienced in making a positive diagnosis in a typical case of foot-and-mouth disease, especially if more than one animal is affected, or disease exists in more than one class of stock.

One may, however, be called in to make a diagnosis in the case of a single animal showing suspicious lesions, either in the mouth or in the feet, and in such a case some difficulty may be found in giving an opinion as to the existence or non-existence of foot-and-mouth disease.

DIFFERENTIAL DIAGNOSIS.

In a paper read before the Midland Counties Veterinary Medical Association Meeting at Birmingham in May, 1918, Mr. A. Holman Berry, of the Ministry of Agriculture, dealt fully with the question of differential diagnosis, and described in detail various pathological conditions affecting the mouth, feet, and teats.

This paper was published in the *Veterinary Record* for June 8th, 1918, and has also been issued in booklet form.

In cattle the condition most likely to be mistaken for foot-and-mouth disease is *vesicular stomatitis*, in which the lesions consist of vesicles in the mouth, usually on the tongue.

The vesicles are very similar in appearance to those of foot-and-mouth disease, although it is stated that the overlying epithelium is tougher, and usually ruptures by means of a small aperture at the apex. The condition is not infectious, there is no foot lesion or lameness, and no marked constitutional disturbance.

Although, as a rule, only one animal is affected, this is not always the case, and one of my colleagues recently visited a farm, in this County, on which four out of sixteen cattle showed these lesions, whilst on another occasion, also in Devon, the condition was seen on three separate holdings in one day.

Some of the other conditions met with whilst investigating reported cases of foot-and-mouth disease are :—Actinomycosis, malignant catarrh, traumatic injuries of the mouth and feet, choking, foul in the feet, and, in sheep, foot-rot and pustular dermatitis, which is known locally as "orf" and "black muzzle."

These conditions will be well known to you all, and would of course present no difficulty in diagnosis, but one must not overlook the possibility of an animal being affected

with foot-and-mouth disease and some other ailment at the same time.

This is not infrequently found to be the case amongst sheep, when foot-and-mouth disease and foot-rot affect the same flock.

I have already referred to certain experiments carried out by the Foot-and-Mouth Disease Research Committee which, as you are probably aware, is at present investigating this disease.

This is the third Scientific Committee which has been appointed by the Ministry for this purpose.

The first Committee, appointed several years ago, carried out investigations in India, but this was discontinued as it was found that native cattle possessed a degree of insusceptibility and were therefore unsuitable for experiment.

The second Committee was appointed in 1920, and undertook work on an obsolete warship, but great difficulties were experienced in carrying out investigations in this way, and the work was discontinued after a few months.

The present Committee was appointed in March, 1924, and has already presented two progress reports, which may be obtained at a small charge from H.M. Stationery Offices. A paper dealing with the work of this Committee was also read before the Central Veterinary Society, on March 3rd last, by Captain F. C. Minett, who was at that time engaged at the Ministry's Research Laboratory.

The difficulties of carrying out investigations with a disease of this nature will be readily realised, expecially as the virus cannot be seen and as attempts to cultivate it in artificial media have so far not been successful.

Early in 1924, two German Scientists, FROSCH and DAHMEN, announced that they had succeeded in cultivating the virus and that they had produced lesions of foot-and-mouth disease by the inoculation of subcultures, but these results have not been confirmed.

It is, however, now recognised that there are two types or strains of virus. These different types which were discovered a few years ago, by VALLÉE and CARRÉ, have been named by them "A" and "O," and it has been shown that an animal which has recovered from an attack set up by one strain and is immune to another attack by the same strain, is, however, not immune to an attack by the other strain.

Before closing, a few figures regarding the prevalence of foot-and-mouth disease in this, and other countries (where the slaughter policy is not adopted) during the last few years may be of interest.

	Gt. Britain	Germany	Denmark	Holland	Belgium	France
1922 ...	1140	15708	223	325	69	4777
1923 ...	1929	17662	64	9200	2160	11300
1924 ...	1440	40538	7941	88930	37287	19812
1925 ...	260	56348	53617	30939	3008	17004
1926 ...	204	187537	97434	62656	35519	48959
5 years ...	4973	317783	159279	192050	78043	101852

Figures published by the Ministry show that only forty-nine outbreaks have been confirmed during the first forty-six weeks of the present year.

The above figures would appear to be a sufficient answer to any critics of the present method of dealing with the disease in this Country.

I do not propose making any further reference to the slaughter policy, except to say that its success depends to a large degree on early reporting.

DISCUSSION.

During the discussion which followed, Mr. W. ASCOTT stated that locally they had been made to "sit up" a little more than they used to do: when the disease was hundreds of miles away they did not treat it with the same awe and respect. The outbreak at Minehead recently, however, brought it close home. He was called by a dealer to a case which looked somewhat suspicious, but was able to agree that it was not a case of the disease, which would have created a great deal of turmoil and excitement. He would like to know, however, if there could ever be foot lesions without mouth lesions.

Mr. C. MASSON referred to the two viruses which had been discovered by a French scientist, and said he understood that after subjection to one an animal was liable to an attack by the second.

Mr. E. R. EDWARDS explained that suspicion of the disease automatically brought the "stand-still" order into operation, and a veterinary surgeon would never be blamed for giving a certificate in a case in which he had a doubt. In regard to a case mentioned in the *Record* for November 19th, in reviewing the Ministry's proceedings for 1926, it was stated that there were symptoms of diarrhœa. Reference had also been made to healing of lesions within a few days. In his experience, healing was well advanced within twenty-four hours.

As regarded vesicular stomatitis, Mr. Edwards pointed out that it did not affect a number of animals, as a rule. He mentioned this because it had been stated in the paper that some people were clever enough to distinguish between that and foot-and-mouth disease. He had seen enough cases of foot-and-mouth disease, but had never yet been able to distinguish the two conditions by any difference that could be seen or felt between the two vesicles. One was stated to rupture a little more easily than the other. History was of great assistance in making a differential diagnosis.

Mr. R. B. NELDER inquired whether the experiments mentioned in connection with a warship were the same as those at Pirbright, and, if not, what were the results of the Pirbright experiments?

Before replying to the points raised in the discussion, Mr. PENHALE thanked the members for the way in which they had received his remarks, and explained that he had been instructed by the Ministry of Agriculture to attend and give the address. With regard to Major Ascott's question, it was usual in adult cattle to find lesions in both the mouth and feet, but Pirbright experiments were quoted which showed that in a few cases mouth lesions had not developed.

With reference to Mr. Masson's enquiry, Mr. Penhale stated that animals which recovered from an attack acquired a degree of immunity against another attack by the same type of virus, but were susceptible to the other strain.

In reply to Mr. Nelder, it was explained that the experiments on the obsolete warship were discontinued some years ago. The Pirbright Station was being used by the present Research Committee and work was still in progress.

Foot-and-Mouth Disease.

In the House of Commons recently, Dr. Vernon Davies asked the Minister of Health if he had any evidence of any cases of foot-and-mouth disease in human beings during recent years; and, if so, would he give details of such cases, showing the source of infection and the result of each case.

Mr. Chamberlain: So far as I am aware, no case of foot-and-mouth disease in a human being has occurred in this country in recent years. The only two cases of suspected

foot-and-mouth disease of which I have any record were investigated by a medical officer of my Department, and in neither case could any confirmation, either clinical or biological, be found to support the suggestion that the patient was suffering from this disease.

Dr. Davies asked the Minister of Agriculture if any meat had arrived in this country from South America in recent years showing evidence of foot-and-mouth disease; if so, what representations, if any, had been made to the South American authorities as to the lack of efficiency of their inspection before shipment to this country; and if any such meat had escaped the vigilance of the inspectorate in this country at the port of arrival here.

Sir K. Wood: No instance of suspected foot-and-mouth disease in meat imported into this country from South America has been reported, although the inspectors at the ports of arrival have for many years examined meat for evidence of this disease. My right hon. friend is not aware of any authenticated evidence of meat affected with foot-and-mouth disease escaping the vigilance of the inspectors at the ports.

Mr. Crawfurd asked the Minister of Agriculture whether, seeing that the Chief Veterinary Surgeon of the Ministry of Agriculture has been in South America since last April investigating the whole system of dealing with export of beasts to this country and that it is now proposed that the Parliamentary Secretary to the Ministry should join him there, he could state why it was necessary for the Parliamentary Secretary to go to South America instead of the Chief Veterinary Surgeon being brought back to report; the nature of the negotiations the Parliamentary Secretary was to conclude with the South American authorities; how long he would be absent; and what was the estimated cost of his visit.

Mr. Guinness: In March the Ministry asked three of the Governments of the countries in South America which export meat to this country to accept certain proposals which were designed to prevent the introduction of the virus of foot-and-mouth disease into Great Britain. With the consent of these Governments, Mr. Frood, a Senior Veterinary Inspector of the Ministry (not the Chief Veterinary Officer) was sent to South America more fully to explain these proposals to the Governments concerned and to collaborate with them in adapting them to local conditions. Mr. Frood has been given every facility to study the disease position, and reports that he has reason to believe that the Governments of the South American countries concerned will find a way to give effect to the Ministry's suggestions. The Parliamentary Secretary, who is going on a pleasure cruise to Rio de Janeiro, will extend his voyage to confer with representatives of the Argentine and Uruguayan Governments and Mr. Frood, in the hope of completing the negotiations in relation to measures for the control of animal diseases which these countries propose to adopt with a view to removing the risk of transmission of foot-and-mouth disease to this country. He will be absent for about seven weeks altogether. The estimated cost to the Ministry is £50.

Mr. Hannon: Is it not of great importance to the settlement of this question in South American countries that the Parliamentary Secretary should visit South America personally and confer with the authorities?

Mr. Crawfurd: Is it not also important that our own diplomatic representatives on the spot should be utilised for this purpose?

Mr. Guinness: They have, and they have been most useful; but the negotiations have reached such a stage that I think it will be of value for the Parliamentary Secretary to be able to take part in them.

Mr. Hurd: Has the right hon. gentleman considered the reasons which caused the United States to take a line entirely opposite from that which he is taking on this matter?

Mr. Guinness: The action taken by the United States is to prevent animal diseases being brought in, particularly rinderpest.

Dr. Vernon Davies: Has any meat contaminated with foot-and-mouth disease been brought into this country from South America?

Mr. Guinness: We have no evidence of that.

Tuberculosis of Bovine Origin in the Human Subject.*

By A. Stanley Griffith, M.D.,
(Member of the Scientific Staff, Medical Research Council.)

Introduction.

The subject of the lecture which I have been invited to give is "Pasteurisation of Milk and its Relation to Surgical Tuberculosis."

I hope that I have correctly interpreted the wishes of the Committee, because I intend to say nothing about the processes of pasteurisation, and to devote the whole of the time at my disposal to that tuberculosis in the human subject which would be prevented by pasteurisation of cows' milk.

It is now common knowledge that milk containing tubercle bacilli can produce tuberculosis in human beings, but there is still some uncertainty among members of the medical profession, to whom the general public look for guidance in these matters, regarding the degree of the danger to human health from bovine tuberculosis.

I therefore welcome the opportunity of placing before an audience which, lay as well as medical, has so much to do with the care and upbringing of young children, the facts which show how greatly the health of the community is endangered by tuberculous milk.

There is a period in the life of every child during which the milk of the cow is an important, if not the chief, article of diet. Cows' milk enters largely also into the food of many adults, especially during sickness. The importance therefore of a milk supply which is pure and free from the germs of disease is obvious.

Unfortunately, cows' milk in the raw state may, and very often does, contain not only a large number of relatively harmless bacteria, but also the germs of infectious diseases.

The diseases that can be conveyed to human beings by milk are numerous. I will mention a few of the chief which have been proved to be transmitted through the agency of milk. These are the intestinal diseases—typhoid, dysentery and cholera; the exanthematous—scarlet fever and measles; throat diseases—tonsillitis and diphtheria, and lastly tuberculosis.

Tuberculosis is probably the most serious of these infections, not only because of the great and widespread suffering it causes, but also on account of the difficulty of its prevention.

Among the milk-borne diseases tuberculosis is in a different category from the majority: the bovine tubercle bacilli are the consequence of disease in the cow, whereas in the case of the other diseases the bacteria gain access to the milk from outside sources.

Milk-borne tuberculosis differs also epidemiologically from other diseases which may be conveyed by milk. Attention is not focussed by a sudden outbreak affecting a large number of people with more or less the same symptoms, as, for example, in the case of typhoid fever. A number of individuals may be infected at the same time by a virulent milk, but the disease will reveal itself in many different forms and after many varying periods of time. Among those infected the most susceptible may die

* Lecture. Reprinted from the Report of the Proceedings of the National Conference on Maternity and Infant Welfare, held in London on July 5th to 7th, 1927.

of general tuberculosis or tuberculous meningitis a few weeks after drinking the tuberculous milk. Others may show no sign that they have been infected until, many months or even years later, tuberculosis appears in a bone, or in a joint, in the skin, or in the kidneys. Others suffer from indefinite malaise for long periods as a result of mesenteric gland tuberculosis. Others again, though infected, may show no clinical symptoms whatever and the internal lesions may heal, but even in these cases accidents which endanger life, such as rupture of an abdominal abscess or stricture of the intestines, may occur.

Since, as mentioned above, owing to the insidious nature of tuberculosis, no sudden outbreak of acute cases occurs to call attention to dangerous infection of milk, the authorities concerned make routine examinations of commercial milk. To find tubercle bacilli in mixed milks when the infection is much diluted it is necessary to inoculate guinea-pigs. In these animals the disease progresses slowly and a positive diagnosis may be made only after 3 to 6 weeks. Then comes the business of finding the individual cow in a herd which has yielded tuberculous milk, and it may be impossible to do so without taking further samples of milk or examining the excretions or discharges of suspected cows.

It will thus be seen that when the source of infection has been traced many weeks have gone by, during which the dangerous cow has continued to infect the milk.

These are a few of the facts in the epidemiology of bovine tuberculosis which show how difficult is the problem, under present conditions, of securing a milk supply free from tubercle bacilli.

The Distribution and the Bacteriology of Tuberculosis.

Before turning to the evidence which has proved bovine tubercle bacilli in milk to be dangerous to man it will, I think, be useful to make a few general observations on the distribution and the bacteriology of tuberculosis.

In civilised communities tuberculosis attacks not only man, but also all the domestic animals. Infection spreads from three main sources or reservoirs, namely, man, the bovine animal and the fowl, each of which has a special type of tubercle bacillus. The three types of bacilli are designated respectively human, bovine and avian tubercle bacilli.

The different species of animals, including man, vary in their susceptibility to these three types. Some species of animals are susceptible to all three types. The pig, for example, may contract tuberculosis from bovines, from human beings, or from poultry. Other species have been proved susceptible to only two of the types—the dog to bovine and human, the sheep to bovine and avian.

Man, like the dog, is susceptible both to human and to bovine tubercle bacilli. Some foreign observers have stated that they have found the avian tubercle bacillus in human tuberculous lesions, but this finding has not been confirmed in this country.

In the cat, the goat and the horse natural tuberculosis is caused only by the bovine tubercle bacillus. Tuberculosis in poultry is caused by the avian tubercle bacillus, and fowls and other domestic birds are quite insusceptible to mammalian tubercle bacilli, either bovine or human.

I will now explain, very briefly, how the bacteriologist determines whether an infection in the human subject is of bovine or of human origin.

There are two principal features by which the two types of bacilli are differentiated—virulence and growth on certain media. In culture the bovine tubercle bacillus grows sparsely on media containing glycerine; it has high virulence for calves, rabbits and goats. The human tubercle bacillus grows luxuriantly on glycerine media and has relatively low virulence for calves, goats and rabbits.

Considerable experience is necessary to carry out the differential tests, but if the tests are properly done there is no difficulty in distinguishing bovine from human strains.

The Sources of Bovine Tubercle Bacilli in Milk.

How does the bovine tubercle bacillus gain access to cows' milk?

Milk may be infected with bovine tubercle bacilli at its source in the udder, or it may be contaminated with the bacilli during the process of milking.

The most dangerous milk is that which is derived from an udder itself tuberculous in one or more quarters. The numbers of tubercle bacilli which pass out with the milk secreted by a tuberculous udder are sometimes enormous. In one cow it was estimated that there were as many as 100,000 (one hundred thousand) per cubic centimetre. As the discharge of tubercle bacilli from such an udder is continuous it will readily be appreciated that the milk from one such cow would make the whole milk from that dairy unsafe for human consumption.

It is not invariable, however, that an udder yielding tuberculous milk should contain tuberculous lesions. The normal mammary gland, as I have shown by experiment, will permit the escape of tubercle bacilli whenever these enter the circulation.

Udder tuberculosis may be initiated by bacilli which pass from the blood stream into the milk cisterns, or infection may spread along the lymphatics from the abdomen or supramammary lymphatic glands. But by whatever route they reach the udder, the bacilli may appear in the milk long before there are definite clinical signs of udder tuberculosis.

On the other hand, milk in the udder may be free from tubercle bacilli and become contaminated during milking. As you are no doubt aware, milk produced in dark and dirty cowsheds by unclean or careless cowmen always contains extraneous matter, the chief constituent of which is cow dung. Tuberculous cows often pass in their excrement tubercle bacilli in large numbers; these are derived from the lungs or intestines.

A cow suffering from tuberculosis of the lung expels from the air passages by the act of coughing purulent material rich in tubercle bacilli. Some of this sputum is discharged from the mouth or nostrils as droplets which may get into the milk directly, but most is swallowed and the bacilli pass out with the fæces. The fæces may also contain bacilli which have been discharged from tuberculous ulcers of the intestine. Fæcal contamination of milk produced under unhygienic conditions is, next to udder tuberculosis, the chief source of tuberculous milk.

The most dangerous animals from this point of view are those which are suffering from advanced tuberculosis of the lungs, because the discharge of tubercle bacilli from such animals is practically continuous. But, as the experimental investigations of M'Fadyean and F. Griffith have shown, the fæces of cows with slight tuberculosis of the lungs often contain tubercle bacilli in small numbers which are discharged intermittently.

You will see, therefore, that even if the obvious sources of infection, *e.g.*, cows suffering from udder tuberculosis or from tuberculous emaciation, or from chronic cough and showing definite clinical signs of tuberculosis, are eliminated from a herd, one cannot be certain without further tests that the milk is likely to be free from tubercle bacilli.

The Results of Bacteriological Investigations of Human Tuberculosis.

I will now deal with the evidence which proves bovine tuberculosis to be an important source of human tuberculosis.

I have on several occasions described the results of the experimental investigations of my colleagues and myself which prove conclusively that milk containing living tubercle bacilli is dangerous for human consumption. As perhaps not all of those present to-day have had the opportunity of considering this evidence I will briefly summarise the results of our observations.

Tuberculosis, as it affects the human being, may be roughly divided into two main groups. In one are placed all the so-called varieties of surgical tuberculosis, and in the other the generalised and pulmonary forms. This division is quite arbitrary and cannot be correlated with the types of tubercle bacilli which are found in those various manifestations of tuberculosis.

My own work, as well as that of my colleagues on the Royal Commission on Tuberculosis, has shown conclusively that every form of human tuberculosis may be caused either by the bovine or by the human tubercle bacillus. These two types of bacilli produce exactly the same pathological lesions; it is only the incidence in different tissues that varies.

To limit my account of the results of our bacteriological investigations to cases of surgical tuberculosis would give, therefore, a very incomplete idea of the ravages of the bovine tubercle bacillus in human beings.

It is the surgical forms of the disease which have yielded the highest proportion of bovine infections, and I propose to describe the results in these first.

In Table I the percentages of bovine infections found in the different forms of surgical tuberculosis in children under 5 years of age and in persons at all ages are set out.

Table 1.

Results of Investigating Cases of Surgical Tuberculosis.

Variety of Tuberculosis.	No. of Cases.	Percentage Infected with Bovine Tubercle Bacilli.	
		Under 5 years of Age.	All ages.
			percent.
Cervical Gland	128	82·6 per cent. of 23 cases	47·6
Lupus	168	62·5 per cent. of 35 cases	52·4
Scrofulodermia	59	50·0 per cent. of 14 cases	35·6
Bone and Joint	541	29·4 per cent. of 102 cases	18·7
Genito-Urinary	23	... ...	17·4

It will be seen from this table that the highest proportion of bovine infections in each of the different forms of tuberculosis was found in children under 5 years of age. In cervical gland tuberculosis it was 82·6, in lupus and scrofulodermia it was 62·5 and 50·0 respectively, and in bone and joint tuberculosis it was 29·4 per cent. You will observe that it is during the milk-drinking period of life that the menace of bovine tuberculosis is greatest.

Of all forms of surgical tuberculosis that which affects the bones and joints is the most serious from the point of view of both the individual and the community, on account of its frequency, the deformity and disability which it causes and the long period of institutional treatment necessary for its amelioration or cure.

Table 2.

Results in Bone and Joint Cases.

Age Periods.	No. of Cases.	Type of Infection.		Percentage Bovine.
		Human.	Bovine.	
0—5 Years ...	102	72	30	29·4
5—10 Years ...	225	172	53	23·6
10—16 Years ...	134	120	14	10·4
16 and upwards	80	76	4	5·0
All Ages ...	541	440	101	18·7

Our investigations, which have extended to 541 cases, have shown that 18·7 per cent. of all the cases of this form of tuberculosis are attributable to the bovine type of bacillus. It is interesting to notice the striking fall in the percentage of bovine infections after the age of 10.

Bone and joint tuberculosis illustrates a different mode of infection from that in cervical gland tuberculosis. In the latter the bacilli are generally conveyed to the glands by the lymph from the mucous surfaces of the nose, mouth and throat, and are either air-borne or conveyed in food.

Bone and joint tuberculosis is with rare exceptions always secondary to some focus in another part of the body and is caused in the great majority of instances by bacilli carried to the structures by the blood.

Table 3.

Relative Proportion of Bovine and Human Infections in Different Forms of Bone and Joint Tuberculosis.

Bones and Joints.	No. of Cases	Percentage Infected with Bovine Tubercle Bacilli.	
		Under 5 years of Age.	All ages.
			percent.
Spine	170	44 per cent. of 34 cases	25·3
Hip	201	16 per cent. of 25 cases	17·9
Knee	65	20 per cent. of 10 cases	6·2
Other Joints ..	74	26 per cent. of 19 cases	14·9
Various Bones	35	27 per cent. of 15 cases	20·0

In our series of cases nearly every bone and joint in the body is represented, and it is noteworthy that the bovine tubercle bacillus has been found in practically all the different bones and joints. No bone or joint appears to be immune from infection with bovine tubercle bacilli. The proportion of bovine infections in the different bones and joints has, however, varied. Comparing spine and hip, which are the most frequently tuberculous, the spine shows a higher proportion of bovine infections than the hip. This can, I think, be accounted for on the assumption that the vertebræ are sometimes infected directly from tuberculous abdominal lymphatic glands.

Lupus, a form of cutaneous tuberculosis, illustrates another mode of entry into the human body, that is, through the skin. Lupus appears sometimes to be caused by tubercle bacilli which are conveyed to the skin by the blood, since occasionally—after specific fevers—the disease breaks out simultaneously in several parts of the body, but in the majority of instances it is, I think, caused by direct infection.

One might expect that if lupus was always caused by blood-borne bacilli the proportion of bovine to human infections would approximate to that which was found in bone and joint tuberculosis. But as you will see from Table 4, which gives the results of ascertaining the type of tubercle bacilli from 168 cases, lupus is caused by bovine tubercle bacilli in more than 50 per cent. of the cases.

TABLE 4.

TABLE OF LUPUS CASES.

Age Periods.	No. of Cases.	Type of Infection.		Percentage Bovine.
		Human.	Bovine.	
0—5 Years ...	56	21	35	62·5
5—10 Years ...	72	35	37	51·4
10—15 Years ...	22	9	13	59·1
15 and upwards	18	15	3	16·6
All Ages ...	168	80	88	52·4

Tubercle bacilli probably gain access to the skin through scratches, abrasions or sores. Lupus often starts in or on the nose, and the infection is then presumably air-borne, or perhaps by direct contact, since the tubercle bacilli are always of the human type. Lupus which begins on the lower parts of the body, on the buttocks and neighbouring parts, is more often bovine than human and is caused by bacilli which have passed through the alimentary tract of persons who are not scrupulously clean in their habits.

Many cases of lupus follow cervical gland tuberculosis, the disease developing in the scar of an operation or of a sinus which results from operation or spontaneous rupture of the glands. In one patient (of whom a slide was shown) lupus began when she was 6 years old as a sequel to glands in the neck. Lupus vulgaris, though mild constitutionally, is a very distressing form of tuberculosis, on account of its intractability and its disfiguring effects. The disease in this girl was very resistant to treatment and gradually spread from the neck and eventually involved the whole of the face below the eyes and the neck and chest to below the breasts, the arms and the palate.

Before leaving the subject of lupus, I should like to refer briefly to the bacteriological results. The tubercle bacilli found in lupus lesions were quite easily identified either as bovine or as human tubercle bacilli. But the great majority of the strains in each group fell below the standard of the type in virulence for experimental animals. I have proved in a number of instances that this change or modification of pathogenic properties takes place in the skin tissues during the course of the disease; it is, I think, a specific adaptation. It is probable that lupus is in all cases primarily caused by bacilli with normal or standard virulence, whether bovine tubercle bacilli or human tubercle bacilli.

Scrofulodermia, another skin disease, is characterised by tuberculous abscesses in the subcutaneous tissues. The percentage of bovine infections was less than in lupus.

In genito-urinary tuberculosis 17·4 per cent. of 23 cases were of bovine origin.

I have now given a brief account of the results of investigating the common non-pulmonary forms of tuberculosis, which do not generally have a fatal termination. The results show that the bovine tubercle bacillus is responsible for a considerable proportion of these forms of the disease, especially in children under 5 years of age.

But it is not only in those forms of tuberculosis which run a relatively mild course that the bovine tubercle bacillus is frequently found. This type of tubercle bacillus is also responsible for many fatalities.

Tuberculosis is a common cause of death in childhood, and with the object of ascertaining what proportion of these deaths could be attributed to bovine infection the type of tubercle bacillus was determined in a series of children dying from all causes between the ages of 2 and 10 years. It was found that 16·8 per cent. of the cases were infected with bovine tubercle bacilli. Of these bovine cases a high proportion—nearly 70 per cent.—died of general tuberculosis or tuberculous meningitis.

Tuberculous meningitis is the most fatal form of human tuberculosis, and is frequently caused by bovine tubercle bacilli. In Table 5 I have collected all the cases we have investigated in which this was the cause of death. You will see that 19·0 per cent. of them were due to tubercle bacilli of the bovine type.

TABLE 5.

TABLE OF MENINGITIS CASES.

Age Periods.	No. of Cases	Type of Infection.		Percentage Bovine.
		Human.	Bovine.	
0—5 Years ...	57	44	13	22·8
5—16 Years ...	33	28	5	15·1
Over 16 ...	10	9	1	10·0
All Ages ...	100	71	19	19·0

The study of the distribution of the tuberculous lesions in relation to the type of infecting bacillus in these *post-*

mortem cases has given valuable information with regard to the paths of infection of the two types of tubercle bacilli.

In all the cases infected with bovine tubercle bacilli the anatomical evidence pointed definitely to the alimentary tract as the portal of entry of the bacilli. In these cases the glands of the alimentary tract were the most severely affected regionary lymphatic glands, and the bronchial glands were either not macroscopically tuberculous or they showed disease of slighter degree and in an earlier stage.

In the cases infected with human tubercle bacilli, on the other hand, the bronchial glands were generally more severely affected than the mesenteric or neck glands. Our investigations have shown that primary bronchial gland tuberculosis in children is almost invariably of human origin.

In phthisis pulmonalis, which, like bronchial gland tuberculosis in children, is usually a disease of respiratory origin, the bovine tubercle bacillus is rarely found.

Before concluding my remarks on the pathology of tuberculosis I should like to refer to an assumption which I consider to be erroneous, and which is responsible for considerable embarrassment to those concerned in forming public opinion on the danger of bovine tuberculosis to human health. This is the hypothesis that bovine tuberculosis serves a useful purpose in immunising children against the more common and serious infection with human tubercle bacilli. It is based on a misconception that the bovine tubercle bacillus is less virulent for man than the human bacillus and produces generally a mild non-progressive disease.

In a paper which I read in 1922 at the National Milk Conference I stated the evidence which I thought justified the conclusion that the bovine type of organism is not less virulent for man than the human type. The further facts which have been accumulated since then have only served to confirm me in this view. It will be sufficient briefly to indicate the nature of the evidence.

Although the bovine tubercle bacillus is limited practically to one channel of entry, the alimentary canal, which is a more uncertain route of infection than the respiratory tract, it is able to produce every variety of human tuberculosis and is a frequent cause of death. Admittedly the human tubercle bacillus is responsible for the great majority of cases of human tuberculosis, but this is evidence not of greater virulence but of the greater susceptibility of the respiratory tract and the wider distribution of the human type of bacillus.

It is impossible to regard the bovine tubercle bacillus, which is capable of producing the most severe and fatal forms of tuberculosis such as meningitis, general tuberculosis and ulcerative pulmonary tuberculosis, not only in children but also in adults, as a suitable immunising agent for human beings.

Summary.

This completes my account of the nature and extent of the damage done to the community by the bovine tubercle bacillus, and I have summarised the results of the investigations from which the data are obtained in Table 6.

This gives for the different varieties of tuberculosis the proportion of bovine to human infections in children under 5 years, between the ages of 5 to 15 and at all ages.

Table 6.
Summary.

Variety of Tuberculosis.	No. of Cases.	Percentage of Cases Infected with Bovine Tubercle Bacilli.		
		0—5 Yrs.	5—15 Yrs.	All ages.
Cervical Gland ...	128	82·6	50·0	47·6
Lupus	168	62·5	53·2	52·4
Scrofulodermia ...	59	50·0	43·3	35·6
Bone and Joint ...	541	29·4	18·6	18·7
Genito-Urinary ...	23	—	—	17·4
Meningitis ...	100	22·8	15·1	19·0
Pulmonary ...	275	—	—	1·1
Post-mortem Cases L.G.B. ...	113	21·3	—	16·8

Total P.M. Cases divided according to Channel of Entry.

Alimentary ...	39		—	82·0
Respiratory ...	129		—	0·8

You will see from Table 6 (1) that the bovine tubercle bacillus plays a part in the causation of all the chief varieties of human tuberculosis, and (2) that the highest proportion of bovine infections was found in children under 5 years of age, and in those forms of tuberculosis in which the primary lesions were in the mucous membrane or in the glands of the alimentary tract.

The age incidence, taken in conjunction with the anatomical distribution of the primary lesions, clearly points to cows' milk as the source of infection with bovine tubercle bacilli.

The human tubercle bacillus causes the greatest number of deaths among human beings, but the mortality from bovine infection is considerable.

I estimate from the above data that the bovine type of bacillus causes not less than 6·9 per cent. of the total deaths. According to the Report of the Registrar-General for 1924, there were 41,103 deaths from tuberculosis in England and Wales. Of these approximately 3,000 died as a result of infection with bovine tubercle bacilli.

I believe that the number of deaths is higher than this, since our series of *post-mortem* cases includes very few children under 2 years of age, when bovine infection is specially frequent and liable to be followed by tuberculous meningitis and general tuberculosis.

Discussion.

These figures relate to conditions which obtained in past years, and it might be argued, now that the Tuber-

culosis Order is in force, that the danger from infected milk must have been greatly reduced.

It is impossible to say whether the total amount of human tuberculosis, due to the bovine tubercle bacillus, has diminished or not, without systematic investigations, which have not been undertaken.

I have, however, during the last 18 months received for the diagnosis of the type of infection material and cultures from a number of cases of tuberculosis, and I regret to say that a large proportion of these has yielded tubercle bacilli of the bovine type.

Table 7 gives the cases, excluding lupus cases, from which cultures of bovine tubercle bacilli were obtained in the years 1926 and 1927.

I have excluded the lupus cases, of which 80 per cent. were bovine, because these were ascertained to have acquired the infection in preceding years.

TABLE 7.

TABLE SHOWING THE CASES FROM WHICH BOVINE TUBERCLE BACILLI WERE OBTAINED IN THE YEARS 1926 AND 1927.

(*a*) Cases which died of Tuberculous Meningitis.

No. of Case.	Age.	Bovine Culture from
M 118	19 years	Cerebro-spinal fluid.
M 125	$1\frac{6}{12}$ year	Cerebro-spinal fluid.
M 132	11 months	Mesenteric gland.
M 144	5 years	Cerebro-spinal fluid.
M 150	3 years	Bronchial gland.
M 151	$1\frac{9}{12}$ year	Bronchial gland.
M 153	$1\frac{1}{12}$ year	Bronchial gland.
M 163	3 months	Bronchial gland.

(*b*) THREE CERVICAL GLAND CASES aged 4, 5 and 5 years respectively.

You will see from this table that the great majority of the cases were of an acute type. *Post-mortem* examinations made on some of the children showed ulcers in the intestines, caseation of the mesenteric glands and general miliary tuberculosis. One child had tuberculous tumours in the brain. There is no doubt that milk which was so heavily infected as to produce these severe and fatal forms of tuberculosis in children and in an adult has sown the seeds of disease in a large number of individuals, who later on will suffer from bone and joint tuberculosis, lupus or some other form of tuberculosis. In the period under review the total number of fatal cases from which cultures were obtained was 19. Of these 8, or 42 per cent., were of bovine origin.

In order to ascertain whether this high proportion of bovine infections during 1926-7 corresponded with an increase in the number of tuberculous milk samples, I wrote to the Medical Officers of Health of some of the large centres of population for their most recent tuberculous milk statistics.

From the information supplied I have constructed Table 8, which shows the percentage of samples of milk taken in 1924-25-26 proved by guinea-pig inoculation to contain tubercle bacilli.

TABLE 8.

TUBERCULOUS MILK STATISTICS.

Place.	Percentage Tuberculous of Total Samples taken.			
	1924.	1925.	1926.	
London (City) ...	12·8	2·4	0·0	
London (County) ...	5·0	5·1	4·5	9·7 in 1st qr., 1927
Birmingham ...	8·6	7·6	9·4	
Manchester	8·1	8·2	10·3	
Leeds...	1·5	6·5	10·4	
Liverpool	10·1	6·3	6·7	
Plymouth	18·2	8·2	1·8	
Cardiff	1·9	3·6	1·8	
Newcastle-on-Tyne	3·2	8·0	4·0	
Edinburgh	14·0	8·8	11·0	

You will observe that the percentage tuberculous was higher in 1926 than in 1925 for most of the large cities. For London County in the first quarter of 1927 the percentage of tuberculous samples was higher than in any of the preceding years.

It does not appear that the present regulations dealing with tuberculosis in cattle have had everywhere the desired effect of reducing the number of samples of tuberculous milk.

The Tuberculosis Order, *if properly enforced in all parts of the country*, would undoubtedly diminish the amount and infectivity of tuberculous milk, but, as you will have realised from what I have said regarding bovine tuberculosis, however strictly this order is administered, it will not result in the disappearance of tuberculous milk. Let me remind you of the long period which elapses before udder tuberculosis becomes clinically manifest, during which the cow is producing tuberculous milk in dangerous concentration, and of the fact that a tuberculous cow, clinically free from disease, may be contributing tubercle bacilli to the milk through her excretions.

As a method of reducing the incidence of bovine tuberculosis some veterinarians and medical men are advocating the immunisation of cattle destined for dairy purposes with living tubercle bacilli.

It is well known that the resistance of cattle to bovine tuberculosis can be greatly increased by injecting them with living human or attenuated bovine tubercle bacilli. But the use of vaccines containing living tubercle bacilli which are pathogenic for man is inadmissible since, as I have shown, they may be eliminated with the milk.

The B.C.G. culture, said by Calmette to be of bovine origin, but attenuated in virulence by cultivation on a medium containing bile, is, however, in a different category. It appears to be avirulent for the bovine animal and to be incapable of producing tuberculosis in man.

There are, however, possibilities which it is desirable to investigate further before this method of attempting to control bovine tuberculosis can be recommended. These are the danger of the B.C.G. culture reverting to the virulent type in the animal and of immunised cows becoming carriers of bovine tubercle bacilli acquired by natural infection.

The only certain way to make raw cows' milk safe for human consumption is to eradicate bovine tuberculosis from the herds, by the gradual slaughter of reactors and the building up of tubercle-free herds.

There are in this country many enlightened and patriotic milk producers who are doing a great deal to improve and make safe the milk supply. These owners have their milch cows periodically tested with tuberculin and examined by the veterinary surgeon, and all reactors or otherwise suspicious animals are removed from the herd. No new animals which have not passed the test after a period of quarantine are introduced to these herds, which in this way are kept free from tuberculosis.

If all dairy farmers would recognise that it is to their interest to eradicate tuberculosis from their herds the problem of bovine tuberculosis would be more likely to be solved.

Tuberculosis-free herds is not an impossible or an impracticable ideal. You will see from Table 9 what has been accomplished by Guernsey. According to Dr. Bishop tuberculosis was introduced into Guernsey 28 years ago by cattle returning from a dairy show in England. Jersey is, I believe, free from tuberculosis. That which can be done in the Channel Islands, and is being done in America on a large scale, can surely be done in this country.

TABLE 9.

BOVINE STATISTICS, GUERNSEY.

	Ten Years, 1910—1919.	Years, 1924, 5 & 6.
Cattle, tuberculin tested	2,426 (Not the total but official testing only.)	2,882 (Total.)
Cattle, tuberculin tested, number reacting and notified according to law	191	2

In the meantime, until the herds have been freed from tuberculosis, what advice upon the milk are you to give to mothers and to those who have the care and upbringing of children?

They should be told that ordinary cows' milk as supplied to households to-day is not safe for human consumption in the raw state, and that it must be sterilised before being given to infants and young children.

Exposure to a temperature of 65°C. for half an hour in a closed vessel is sufficient to kill tubercle bacilli. This exact scientific treatment of milk cannot, however, be carried out in the homes of the less well-to-do. It is better, therefore, to recommend that the milk should be brought to the boiling point of water, preferably in a closed receptacle.

It ought not, however, to be necessary for each household to take these precautions before cows' milk can be safely given to children, and the people have a right, and ought to insist, that an essential article of diet for children should be supplied to their homes free from the germs of disease. It is almost equivalent to having a water supply containing typhoid germs and instructing each household to boil the water. Yet the results of drinking tuberculous cows' milk may be much more serious for the individual than an attack of enteric fever.

But because bovine tuberculosis in the human being is insidious in its nature, because it only kills a child here and maims another there, without certain indication of its origin, no deep or lasting impression is made on the public mind, and the authorities are not stimulated to take the action which they would be forced to take with one of the more acute diseases.

Great precautions are taken to prevent the sale of tuberculous meat, but tuberculous milk, a much more dangerous product, is permitted freely to be sold for consumption in the raw state by young children.

What can be done to protect the community from the effects of tuberculous milk? In view of the great prevalence of bovine tuberculosis, it obviously would not do to condemn the milk of all tuberculous cows; there would be a milk famine. It is equally obvious that the sale of milk containing living tubercle bacilli should not be permitted to continue.

One course which might be adopted, in addition to the measures now in force, is the pasteurisation of all milk which proceeds from tuberculous herds. The efficient pasteurisation of milk from all reacting cows would undoubtedly result in the prevention of the great part of human tuberculosis of bovine origin. On economic grounds, also, dairy-farmers should not lose sight of the desirability of possessing tuberculosis-free herds.

LONDON UNIVERSITY EXAMINATION APPOINTMENTS.

The following have been appointed by the Senate of the University of London, to act as Examiners for the Intermediate and Final Examinations in Veterinary Science for Internal and External Students in 1928:—

VETERINARY ANATOMY.—J. McCunn (R. Vet. Coll.) (Chairman); and the External Examiner.

VETERINARY PHYSIOLOGY.—W. L. Symes (St. Thos. H.M.S. and R. Vet. Coll.) (Chairman); and the External Examiner.

VETERINARY HYGIENE.—G. H. Wooldridge (R. Vet. Coll) (Chairman); and the External Examiner.

VETERINARY PATHOLOGY.—T. Hare (Chairman); and the External Examiner.

The Veterinary Record.

31st December, 1927.

THE OLD YEAR AND THE NEW.

By J. W. McIntosh, M.R.C.V.S., F.R.S.E.,
President N.V.M.A.

At this season it is our primary pleasure and privilege to extend to all our readers sincere wishes for a happy and prosperous New Year.

The termination of the Great War witnessed the re-organisation of our Association, and we are glad to be able to note, with a deep sense of gratitude to all those whose practical help and encouragement alone made it possible, a steady increase in stability and expansion of influence.

It is particularly gratifying to be able to record a marked increase in our membership during the past twelve months, but a serious assessment of the position still leaves us with a sense of disappointment—a membership of approximately 50 per cent. of the total strength of the profession is not good enough.

The N.V.M.A. cannot afford to have its hands weakened either economically or financially by the existence of so large a number of veterinarians who take no share in its activities, and who fail to realise the importance of playing their part in securing 100 per cent. efficiency for an organisation which exists purely for the purpose of furthering our common interests and the public weal.

The profession is showing an unprecedented degree of concern for the elevation of its status, and the recognition of its rights and privileges. How can these things be achieved in the face of uncompromising and often surprising opposition, if the Association's arm is robbed of half its potential strength? It is only by uniting in a true spirit of comradeship and sacrifice that we can hope to conquer those difficulties.

Surely, then, it is not too much to ask of all who have not yet joined the ranks of our Association to do so *now*—they will be heartily welcomed, and they will show the world that although we may differ about this or that, still we can clasp hands heartily and join in the work of science and good fellowship, and in this our day strive to advance the interests of a great inheritance. We gratefully acknowledge the excellent work which is being done by the affiliated Divisions in stimulating interest in the activities and welfare of the parent body.

The Torquay Congress was one of the finest and most helpful in the history of the Association, and we look forward to the Newcastle gathering of 1928 to equal or even surpass that effort.

Our financial position still wants improving, but it is no longer a matter of such concern as to constitute a grave drag on the wheels of progress, and for this transformation we tender our heartiest thanks to our members for their promptitude in meeting their financial obligations to headquarters.

As an Association, therefore, we enter the New Year with feelings of great hope and confidence. In the days before us may the sense of brotherhood in a common cause—the advance of the profession—bring us nearer to the realisation of our ideal, *Vis unita fortior.*

Royal College of Veterinary Surgeons.

EXAMINATIONS—DECEMBER, 1927.

LIST OF SUCCESSFUL CANDIDATES.

DUBLIN.

Class A.
*McEldowney, J. P.
Spears (Miss) K. M.

Class C.
Furney, J. E.
Lowndes, J.
McGeady, P. A.

Class D.
Bisset (Miss) H.
Downes, C. P.
Peatt, J. N.

GLASGOW.

Class A.
Briscoe, T. P.
*Catchpole (Miss), A. M.
Hamilton, R.
McDonald, A. M.
Wilson (Miss), P. M.

Class B.
Gillies (Miss), L. G.
*Gray, W. J.
Kent, R. K.

Class C.
Bartholomew, A. L.
Hamilton, J. C.

Class D.
Macmenemey, J. M.
Patterson, J. H.
Spence, J. A.
Thomson, A.

EDINBURGH.

Class A.
Barker, G. G.
Calder, D. A. L.
Fraser, F. G.
*Hossack, H. W. J.

Class B.
Buchanan, A. S. W.
*Leiper, T. W. M.
Mather, A.
Newton, H. W.
Speed, J. G.

Class C.
†Davidson, C. B.
Grasovsky, Y. S.
Irwin, T. H. R.
Kennedy, D.
Priestley, F. W.

Class D.
Bain, H.
Edwards, J. T.
Findlay, J. H.
Hume, A. C.
Johnson, J. F.
Macpherson, D. A.
Michie, N. G.
Reid, J.
Ritchie, J.
Souter, J. G.

† denotes 1st Class Honours.
* „ 2nd „ „

LIVERPOOL.

Class B.	*Class C.*
Davies, D. E.	Curtis, H.
White, R. S.	Marginson, G. C.

Class D.
Davies, B. E.
Shedlock (Miss), K.

LONDON.

Class B.	*Class C.*
Andrewes, F. N.	Bhandari, M.
Francis, F.	Boughey, F. D.
Isherwood, R. V.	Cartland, B. S. T.
Loveless, S. F.	Davies, T.
Marshall, K. I.	Garside, J. S.
Norrington, C. P.	*Hole, N. H.
Woods, E.	*Messervy, A.
	*Sheriffs, J. T.
	Singh, H.
	Thomas, A. L.
	Turney, J. T.

Class D.
De Garis, J. A.
Hale, D. M.
Hedley, J. F.
Hodgman, S. F. J.
Prime, T. R. C.
Shah, S. I. A.
Thompson, P. G. M.
Webb, E. A.
Xuto, C. S.

*denotes 2nd Class Honours.

CHILIAN APPOINTMENTS.

On the recommendation of Lt.-Col. T. D. Young the following members of the veterinary profession have been appointed as meat inspectors for a period in Chili. They sail from Liverpool in the S.S. "Orduna" on January 4th, 1928: Mr. L. B. A. Grace, M.R.C.V.S., D.V.S.M.; Mr. A. H. Hunter, M.R.C.V.S., B.V.Sc. (Toronto), D.V.S.M.; Mr. D. W. Mills, M.R.C.V.S., B.V.Sc. (Liv.), D.V.H. (Liv.); Mr. J. A. R. Robertson, M.R.C.V.S., D.V.S.M. (Vict.).

FOOT-AND-MOUTH DISEASE.

In the House of Commons on December 21st, Major Glyn asked the Minister of Agriculture what had been to date the total sum paid as compensation by the Government to the owners of animals slaughtered as a result of foot-and-mouth disease outbreaks since 1918; what was the wage paid to the slaughterers; and whether, in view of the cost to the taxpayer, he would consider offering a reward of at least £20,000 sterling to any scientist who will produce an effective remedy or preventive of this disease.

Sir G. Hennessy, Vice-Chamberlain of the Household, who replied, said: The total sum paid in compensation since 1918 to December 15th, 1927, amounts to £5,186,833, but £877,037 has been received from the sale of carcases of animals slaughtered. The wages paid to slaughtermen vary according to the district and the special circumstances of the case, but are generally about 1s. 6d. per head for cattle and 1s. per head for pigs and sheep. The discovery of an effective remedy or preventive of the disease is more likely to be made by the Foot-and-Mouth Disease Research Committee, which has been at work since 1924, than by the offer of a monetary reward.

CLINICAL REPORT.

The Therapeutic Value of Hypodermic Oxygenotherapy in the treatment of Canine Distemper.

By D. BUCHANAN, M.R.C.V.S., D.V.S.M., Edinburgh.

As one who was much interested in the clinical report "Paralysis in Dogs," by Lieut. Colonel H. T. Ryan, D.S.O., F.R.C.V.S., which was published in the *Veterinary Record*, No. 42, Vol. VI., I at once decided to give the method a thorough test, not only in the treatment of nervous complications following distemper, but primarily as a treatment for canine distemper before the onset of the distressing nervous disorders with which we are all familiar.

During the past fourteen months I have taken every available opportunity for using oxygen gas on cases of canine distemper and, so far as my experience goes, consider that oxygen is by far the most powerful therapeutic agent one can use to deal with this scourge of the canine race. So profoundly have I been impressed with the use of oxygen that I have not the slightest confidence in any other method of treatment, with the possible exception of treatment by anti-serum. For a practitioner merely to prescribe a number of aspirin or quinine powders and be content with advising an owner to keep the patient warm seems to me utterly futile and, further, is a course that is ualikely to impress the intelligent owner, who, in such cases, only too often, sees his or her canine friend steadily losing ground as the days pass, until in a large proportion of cases nervous phenomena develop, and if death or destruction does not terminate the case, the once healthy animal is left a canine wreck.

The most important requirement is to start the treatment as early in the course of the disease as possible. As with most other forms of treatment for distemper, one can hardly hope for good results if a case has been going on for a fortnight or longer before treatment is commenced.

All that is necessary in the way of apparatus is an oxygen cylinder (preferably of a convenient and portable size such as the 12 cub. ft. cylinder), a nipple and union for the cylinder valve, valve key and gland nut spanner, and a length of three feet of high-pressure rubber tubing. One end of the latter is firmly tied on to the haft of a fine hypodermic needle by means of flexible copper or steel binding wire, and the other end of the rubber tubing is fastened in a similar manner to the tube connection of the nipple and union. No fine adjustment valve or other accessory is necessary or desirable. It will be found more economical to purchase a cylinder than to use hired cylinders. (See instructions for the care of cylinders).

The quickest and safest method to release the gas is to lay the cylinder on the floor between one's knees, so as to obtain the greatest purchase when opening the valve. Insert the valve key, open the valve sharply, and as quickly almost close it again, until the oxygen can just be heard hissing faintly from the valve outlet socket. The judging of the degree to which the valve should be closed is quickly acquired by practise, as it naturally varies very slightly according to the pressure of the gas in the cylinder. Next connect to the valve outlet socket the nipple and

union with rubber tube and hypodermic needle attached. As the nipple and union is slowly screwed home a close watch must be kept on the short length of rubber tubing for the sudden appearance of any ballooning of the latter. The tube must also be watched during the time that the needle is inserted beneath the skin of the patient. The valve key must be kept inserted on the valve spindle, so that the gas can be turned off instantly, should ballooning of the tube occur. Another precaution for those who are using the method for the first time is to make sure that neither the patient nor any occupants of the room are standing in the direction in which the hypodermic needle is pointing, before being inserted into the patient. This done, allow the rush of gas to clear the tube and needle of any dust particles for a few seconds, and then without further ceremony, other than the application of a clove hitch to the dog, insert the needle beneath the skin of the lumbar region, a little to one side of the mid line. If the skin is clean no preliminary disinfection is necessary. The oxygen is allowed to infiltrate subcutaneously, until the skin on both sides of the thorax is well distended. This can be taken as a general statement applying to all breeds. The needle should of course be withdrawn if the patient shows any signs of dyspnœa, but this is rarely the case. It is hardly necessary to add that the needle should be held carefully while inserted, in such a way that, in the event of the patient making any sudden movement, it can instantly be withdrawn without risk of entering the peritoneal cavity.

If distemper, or suspected distemper, has been in existence for a few days of longer before I see the case, *i.e.*, in those cases where it is desirable to supply the patient with the necessary antibodes quickly, to make up for lost time, I make a practice of giving a hypodermic injection of distemper anti-serum of a reliable brand, such as that of Messrs. Parke, Davis and Co., and then "inflate" the patient with oxygen.

In all cases the oxygen treatment should be repeated every second day until the temperature is absolutely normal, and has remained normal for longer than a day. In most cases it will be found that the temperature is normal after the second or third treatment, provided that the dog has been placed in a body jacket, well fed, protected from draughts, and kept near a fire, and generally properly nursed. I always prescribe a cod liver oil and malt extract preparation as an addition to the dietary.

As regards pulmonary, alimentary, and nervous complications, it is my experience that these do not arise where oxygen is given early in the course of the disease, and where it is continued at intervals for a sufficient length of time in special cases, *e.g.*, Alsatian wolfhounds, and where the importance of scalding all feeding utensils has been sufficiently impressed upon the owner.

For valuable dogs and animals which make little or no natural resistance to distemper, *e.g.*, Alsatians, I find it useful to give two or three injections of distemper anti-serum on alternate days with oxygen treatment, after which the case can be easily controlled by the use of oxygen alone. In Alsatians and other foreign breeds I strongly advise continuing with the oxygen every second or third day for a fortnight or even longer.

Owing to pressure of work, I am unable to supply a record of cases treated, but may state that oxygen alone has, in my hands, frequently reduced temperatures of 105°F and over to normal within twenty-four hours.

Not the least benefit which oxygen confers is the fact that in cases of distemper, where appetite is in abeyance, the animal is usually eating, voluntarily, on the day following the first treatment.

The owner should be warned not to relax general precautions even after the temperature has become normal, and in certain cases it is advisable to ask the owner to note the daily temperature or to keep a temperature chart, so as to secure a further oxygen treatment in the event of any subsequent rise of temperature.

In this connection, it is well to remember that the oxygen does not kill the invading micro-organisms, its beneficial result being brought about probably through the creating of an unfavourable environment to the rapid multiplication of the bacteria within the tissues of the host, by the oxidising of harmful toxins elaborated by these bacteria, and their conversion into harmless products, by the promotion of phagocytosis, and ultimately by enabling the patient to form its own antibodies.

It can readily be understood, however, that the weakly animal (and here the presence or absence of intestinal parasites has to be taken into account) has much more need of repeated oxygen treatment with occasional doses of distemper anti-serum or nuclein, etc., to promote complete recovery.

Should there be any of my professional colleagues who are heartily sick of the orthodox methods of dealing with distemper, I shall feel satisfied if I have stimulated their interest sufficiently to induce them to give this method of treatment a reasonable trial. It has three commendable qualities. It is simple, practicable, and effective. The treatment need not occupy more than five minutes.

In conclusion, the success of oxygen can be perhaps judged from the fact that on the day following the first application, in many cases the effect is so striking that the chief difficulty is to make the owner realise the necessity to continue to maintain general precautionary measures.

ABSTRACTS.

[Braxy-like Disease of Sheep in Hawke's Bay. Its Association with Liver-Fluke. C. S. M. Hopkirk, B.V.Sc., Officer in Charge, Wallaceville Veterinary Laboratory. *New Zealand Journal of Agriculture.* XXXV. 141].

This disease is described as occurring in the well-watered, hilly country near the sea coast in Hawke's Bay Province. It is characterised by the sudden death of animals which only a few hours previously had appeared perfectly healthy.

The incidence of the disease is associated with the infestation of the sheep with young liver fluke, and weather conditions, except in so far as they affect the developmental stages of the fluke, are of little importance.

On *post-mortem* the liver appears to be the chief seat of the disease, presenting small greyish-white necrotic

areas surrounded by a zone of hyperæmia. The pericardial sac contains an excess of fluid and the other lesions are those associated with a toxæmia.

Microscopical examination of the necrotic areas in the liver shows coagulative necrosis of the liver cells and felted masses of bacilli, some of which may be sporulating.

The heart blood and pericardial fluid are sterile, but cultures of what was believed to *B. œdematiens* were obtained from the liver.

The disease was reproduced experimentally in sheep by the inoculation of small quantities of culture into the liver.

The preventive measures recommended to farmers are those of fluke eradication.

Red Squill as a Rat Poison.

The Ministry of Agriculture advocates the use of red squill poison in baits intended for the destruction of rats and mice, in preference to other stronger poisons sometimes used, such as strychnine, arsenic, and phosphorus. Red squill is particularly recommended for use on farms and in places where, owing to the presence of poultry, livestock, domestic animals, or stored food supplies, special care is necessary. Red squill poison is extracted from the red squill bulb (*Urginea maritima*) which grows on the sandy shores of the countries bordering the Mediterranean Sea. It may be used in powdered or liquid form in baits consisting of bread (or oatmeal), fat, syrup, and a few drops of aniseed, or in biscuit or other form supplied by firms who deal in rat destruction preparations and appliances. From experiments recently carried out on behalf of the Ministry, the following general conclusions were arrived at:—

(*a*) Female rats are killed by doses of red squill approximately only half as great as those generally needed to kill male rats.

(*b*) The finer the red squill powder is ground the more toxic it becomes.

(*c*) The best red squill baits for general use are those made from a finely ground and completely dried product of the bulb itself.

(*d*) The average lethal dose for male and female rats is, approximately, 0.50 and 0.27 gms. respectively.

(*e*) The white squill (used for medicinal purposes) is useless as a rat poison.

A series of experiments was also carried out with calves, sheep, pigs, and rabbits, which were given red squill powder in their feed, and, in spite of the fact that they had been given no other food for the preceding 24 hours, it was found almost impossible to induce the animals to eat any appreciable quantity of the poisoned feed. It would appear, therefore, that on the grounds of palatability alone there is little danger of such animals eating a sufficient quantity of red squill baits to cause ill effects. In those cases where the animals were induced to take the poison, it was found that unless a considerable quantity of the poison was consumed no ill effects were noticed. Experiments with fowls showed that they took the poison more readily, but even then it was found that to kill a fowl required a dose between 20 and 30 times as large as that necessary to kill a rat. These experiments appear to show that, while fatal to rats, red squill poison is comparatively harmless to larger animals, and rat officers are urged to consider the desirability of using preparations containing this toxic agent, particularly in those cases where domestic animals and poultry are kept in the vicinity.—*Journal Ministry Agriculture*, October 1927, 597.

[Studies on Three New Genera and some Little-known Species of the Nematode Family, *Protostrongylidæ* Leiper, 1926. T. W. M. Cameron, D.Sc., Ph.D., M.R.C.V.S. *Jl. Helminthology*, 1927, v., pp. 1-24.]

A group of parasites of great interest to the veterinary surgeon is the Metastrongylidæ (Protostrongylidæ) or lung worms. Those living in the trachea and bronchi are relatively well known but until recently the forms living in the alveoli or terminal bronchioles were almost unknown. This paper is a description of these forms and in addition to a review of the literature on the subject the following species are described: *Protostrongylus rufescens* (=*Strongylus rufescens*, hair lung worm of sheep); *Muellerius capillaris* (the commonest member of this group in Britain); *Aelurostrongylus abstrusus* (the cat lung worm) and several species from wild mammals in Britain (including the polecat and weasel).

[1. Observations on the Life History of *Aelurostrongylus abstrusus* (Railliet), the Lungworm of the Cat. *Jl. Helminthology*, 1927, v., pp. 55-66. **2. Observations on the Life History of *Ollulanus tricuspis* (Leuck), the Stomach Worm of the Cat.** *Jl. Helminthology*, 1927, v., pp. 67-80. By T. W. M. Cameron, D.Sc., Ph.D., M.R.C.V.S.]

1. A parasite which is very common in cats in various parts of Britain is the lungworm, *Aelurostrongylus abstrusus* a minute species under half-an-inch in length. This species deposits eggs throughout the lungs and these eggs hatch *in situ*. From them emerge small larvæ with a peculiar sigmoid bend to the tail. They pass up the trachea and are swallowed, reaching the exterior in the droppings. They are easily recognised in fæcal smears by means of their characteristic tail. They do not further develop unless the fæces are swallowed by a mouse. In that animal, they reach the intramuscular connective tissue, where they encyst and wait until the mouse is eaten by a cat. They then escape from the cyst and migrating to the lungs, reach sexual maturity. The disease which they cause in cats is often fatal.

2. Another common form in cats in this country is *Ollulanus tricuspis*, a minute species living in the stomach and causing a catarrhal condition of that organ. It has a very peculiar life cycle. In the single ovary of the female, a few large eggs are formed. They hatch and give rise to a larva which moults, still in the uterus. Finally, there emerges from the mother an infective form, about half the length of the parent and like the adult, possessing atricuspid tail. This form does not appear to leave the stomach with the food and larvæ have never been found in the intestine. Experimentally it has been found, however, that they can reach the exterior in the vomit: and, in nature, the condition of the stomach and the ability of the

cat to vomit makes this the probable normal method of escape. If the vomit is eaten by another cat (the parasite is commonest in emaciated stray animals) they continue their development in its stomach, moulting once before they attain maturity.

[**On the Parasitic Development of** *Monodontus trigonocephalus*, **the Sheep Hookworm.** By T. W. M. CAMERON, Ph.D., D.Sc., M.R.C.V.S. *Jl. Helminthology*, 1927, v., pp. 149-162.]

One of the commonest parasites of sheep throughout the world is the hookworm, *Monodontus trigonocephalus* (or *Bunostomum trigonocephalum*), a close relation to the hookworms of man, dogs, cats and pigs. Like the others, it feeds on the mucosa of the small intestine, moving from one place to another as it requires new material and leaving little bleeding spots where it had previously fastened.

Its life history appears to be almost identical with those of the other hookworms, except that the infective larva has not yet been found capable of penetrating the skin. This life cycle is divided into five stages (excluding the egg) each of which is separated by a moult. The egg hatches in the droppings giving rise to a minute larva which actively feeds on the fæcal material and after a day or so moults. The second larva is similar to the first but slightly larger. It also feeds on fæces, grows and moults and produces the third stage or infective larva. This form climbs up on to the grass and is swallowed by the sheep in the food. In the intestine this form also grows and moults and gives rise to a larva with a totally different appearance. It has now acquired a small round mouth capsule and is able to feed on the mucosa of the intestine. In it, also, the sexual organs can now be differentiated. It also grows considerably, finally moulting to give rise to the adult. The newly hatched adult is not yet full sized and it is only after some time that it reaches its maximum size of about an inch and becomes sexually mature.

H.M. STATIONERY OFFICE PUBLICATION.

The undermentioned has been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office, at the following addresses:—London: Adastral House, Kingsway, W.C.2, and 28 Abingdon Street, S.W.1; Cardiff: 1 St. Andrew's Crescent; Manchester: York Street; Edinburgh: 120 George Street.

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VITALITY OF THE ANTHRAX BACILLUS.

A fatal case of anthrax in a Shorthorn dairy cow on a Cumberland farm is the second outbreak there in five months and the fifth isolated case which has occurred in the same field during a period of about twenty years. It is thought that spores of the anthrax germ have been perpetuated in the soil through the burial of a carcase of an anthrax-affected cow before the enforcement of the regulations by which carcases of affected animals are required to be cremated.

Over twelve years' immunity was enjoyed, during which time the field was ploughed out and cropped, but the enclosure has again been laid down in grass.—*Manchester Guardian.*

REVIEWS

[**Bi-sexuality—An Essay on Extraversion and Introversion.** By THEODORE J. FAITHFULL, M.R.C.V.S., Principal of The Priory Oak School. pp. 96. Published by John Bale, Sons & Danielsson, Ltd. 1927].

This is an interesting book, well and simply written, and not the less interesting because it reveals the author and the school of thought he represents, nearly as fully as it does the subject with which it treats. The work is essentially a treatise on psycho-analysis from the purely sexual point of view, and it is not too much to say that the author seems to labour that point of view, as in the opinion of common men do the majority of psycho-analysts.

In a glossary at the end of the book, "Extraversion" is defined as "The outward flow of libido towards or into a person or object," and "Intraversion" as "The inward flow of a person's own libido, or that extraverted from another person or object."

The American Medical Dictionary defines "libido" briefly as "Sexual desire," but Mr. Faithfull's glossary describes it as "The spiritual or psychical energy present in all living cells and accruing as a surplus as a result of co-operation in multicellular animals."

A comparison of these two definitions gives the key to the motive of the book which is to show, more simply than Freud and others have already done, that the sexual desire of the common man's terminology is the *raison dêtre* of most things for the psycho-analyst. And the common man, if he will read this book, may end by admitting that sexual desire is by no means the simple thing he thought it was. He will have to admit that the school of thought of which Mr. Faithfull is no negligible exponent has done much to explain that which was formerly obscure, and that some of the knowledge thus made available may be most usefully and beneficially applied in domestic life, especially in the education of children It may even do more than this and form our politics, our schemes of social betterment, and even our religion.

Briefly, Mr. Faithfull makes it clear to the ordinary reader that much human trouble is due to the excessive dominance or otherwise of "maleness" or "femaleness" in individuals, either constantly or periodically, and that, when these characters are not properly balanced in the mating of man and woman, misery is apt to result, not only to the persons concerned but to the offspring. He further describes, and here no doubt he is helped by his experience as a schoolmaster, how an ability to discover these characteristics in children may obviate much misunderstanding and unconscious cruelty in education. He suggests in fact that a proper diagnosis and treatment of the abnormality may make all the difference between absolute failure and supreme success in after life.

In much of what the author had to say on these and allied matters I found myself in ready sympathy: no person of average intelligence who suffered the repressions and even the persecutions of Victorian ultra-pious domesticity could fail to appreciate this swinging of the pendulum towards freedom and real kindness; but the teaching goes too far.

It is so often thus: from the day when the allegorical cobbler declared to his fellow councillors that for con-

structional purposes there was nothing like leather down to the present hour of dietetic and psycho-analytical and other faddists it is common to find that the light of truth, be it ever so small a ray, blinds the beholder to other equally important things, temporarily beshadowed. From the unenlightened point of view the author seems at his worst when he tries to show the bearing of bi-sexuality on disease. For example: "Consumption is a ready means of satisfaction to an introvert who cannot use the libido in artistic or mental creative work, and who either has not a womb to use, or if possessed of one does not wish to use it, or whose desires in that direction are inhibited by attachments to relatives or economic necessity. . . . . The tuberculous bacillus taking up the libido gives the source of satisfaction that would come of child-bearing.

"Freud, Steckel and many other workers in the field of analytical psychology have pointed out the tendency in unsatisfied adults to seek to fix their libido in ways belonging to infancy, childhood, and adolescence, when the ways more natural to their age are unobtainable. Chronic constipation is one of these ways and it is used to satisfy introverted or female desires. In women it gives partial psychological satisfaction for the non-use or inadequate use of the vaginal passage."

And so on, in a way that often seems to me sheer nonsense. Nevertheless, although there is not much of purely veterinary interest in the book, it is well worth our reading. It is expedient nowadays for every thinking man to know something of the work of the psycho-analytical school of philosophy and especially for those who, like ourselves, are essentially biologists.

J. W. R.

"Live Stock Journal" Annual for 1928.

Although there are many wild exaggerations current as to the agricultural position to-day, 1927 has not been a happy year for the farmer. For stockbreeders the year has been one of cheer and gloom. Half-way through the season a clean bill of health, so far as foot-and-mouth disease was concerned, brought a fine rush of foreign trade, with promise of more, but breeders' hopes of a tide of prosperity were short-lived, for the disease appeared soon after, since when the country has not once been free. At home trade has been fairly well maintained. Pigs and sheep have slumped, but there are signs that the bottom has been reached. Beef and dairy cattle meet a fair trade (a good one in the case of some of the milch breeds). Heavy geldings still command good prices. These are some of the facts to be deduced from THE LIVE STOCK JOURNAL *Annual* for 1928 now on sale.

There are many articles of interest in the section of the *Annual* devoted to general farming subjects. Polo enthusiasts, whether interested in the game as players or breeders, will read with great interest Mr. Tresham Gilbey's article "More Pony Breeders Needed." Mr. Gilbey offers breeders some valuable hints as to breeding only from "known quantities"—*i.e.*, mares experienced in the game and possessing Polo temperament.

The breed reviews begin, as usual, with Shire horses, of which breed Mr. J. A. Frost says: "The (heavy horse) industry has not flourished to the satisfaction of many members of the Shire Horse Society." But the pages of current history which follow suggest that there are a great number of tenant farmers and others who have a strongly based confidence in the breed. "Fear Beag," writing of Clydesdales, speaks of the high degree of soundness the breed has now reached. As to the suggested fusion of the Shire and the Clydesdale breeds, he tells us that Clydesdale breeders are unperturbed over the discussion. In a year of severe agricultural depression there has been a well-maintained demand for Suffolk horses, "Lavengro" tells us in his article on that breed. In the review of Hunters we read that 1927 produced better Hunters, both in the breeding classes and under saddle, then any season has been responsible for since 1914. Mr. J. S. Sykes entertainingly writes of Hackneys, Hackney ponies and harness horses in 1927. Of the last-named he says: "The show season of the harness horse may be written down as one of the most trying, owing to the incessant wet weather which made it hard for horses as well as men." Welsh ponies and cobs are dealt with by "Lancastrian" in an informative article.

Then follow the cattle breeds. Mr. V. H. Seymour, writing on Beef Shorthorns in England, is of the opinion that time alone will show whether the past twelve months will have seen the end of that decline in prices which has been symptomatic of the previous six years. Mr. W. G. C. Britten's Hereford review says the demand, both private and public, for Hereford bulls for crossing purposes has been very keen. The Aberdeen-Angus has gone well ahead, according to Mr. J. R. Barclay. The Red Poll export trade has shown a certain liveliness in 1927, "Lavengro" tells us, while at home the breed is in high favour. Mr. Arthur Furneaux writes of Dairy Shorthorns. Breeders of the variety have, he says, no reason to be dissatisfied with the record of their favourites in 1927. The D.S.A. Grading Register is going ahead strongly. Nothing but good can result from the scheme, providing only the right type of foundation animal is approved by the inspectors, and the greatest possible care is exercised in the selection of sires. The British Friesian breed, reviewed by Mr. George Hobson, has held its own well during this gloomy year. Many new 2,000 gallon cows have been noted in British Friesian herds during the year, and the proud record of the breed in this connection is now as follows:—Six 3,000 gallon cows; one twice 3,000 gallon cow; 179 2,000 gallon cows; 44 twice 2,000 gallon cows; 17 three times 2,000 gallon cows; 4 four times 2,000 gallon cows and one five times 2,000 gallon cow.

The *Annual* contains an attractive section devoted to Studs, Herds and Flocks Illustrated; Breeders' Directory; the usual complete list of agricultural and live stock societies, breeders' tables, foreign trade statistics and a wealth of other information. There are two editions of the *Annual*—one with coloured art cover at 2s. 6d. net, by post 3s., foreign 3s. 3d.; and a cloth edition, with red leather back, 4s., by post 4s. 6d., foreign 5s. The publishers are Vinton and Co., Ltd., 8 Bream's Buildings, Chancery Lane, London, E.C.4.

ST. DUNSTAN'S ANNUAL REPORT.

"While Memory Lives," the title of this most human and interesting report of St. Dunstan's activities on behalf of the war-blinded men of the Empire, seems to us particularly appropriate. We must never forget that these men who lost their sight in the world war are blinded for life. However much, and it is a great deal, that St. Dunstan's has been able to do for them, in re-training them to crafts and occupations, and in setting them up in their own homes and businesses, they will always be blind and so will need constant care and supervision of their family and business interests. This outstanding fact is strongly emphasised in the Report which lies before us.

The Foreword states that the reduction in the numbers of new cases demanding St. Dunstan's attention for training and settlement has permitted a scheme of re-organisation which will promote economy without depriving any beneficiary of the standard of assistance for which he has come to rely upon the Organisation. The remaining trainees have been transferred to St. Dunstan's establishment at Brighton, where suitable accommodation has been provided for their needs and for any new cases which may be expected for some years to come. The administrative work will

continue to be done at Regent's Park, but the lease of the large mansion and grounds will be disposed of. The Report points out that these changes place St. Dunstan's Organisation on a semi-permanent footing. The following are some of the more important and interesting conclusions at which the actuary arrives in his Report:—"1,322 blinded soldiers will still be living in twenty years' time; in forty years there will be 445 still living, all of whom will be over sixty-five years of age. To endow St. Dunstan's this year, 1927, we should need to possess a capital fund nearly three times as large as our present assets. The sum of £145,078 a year for fifteen years would enable the training and settlement that still requires to be done to be completed, our After-Care Organisation to be continued, and a sufficient surplus set aside each year to endow St. Dunstan's at the end of that time."

We cannot think that anyone having before them the wonderful record of the work accomplished by St.Dunstan's in the past twelve years will fail to contribute as generously as possible to ensure that the funds needed will continue to be forthcoming.

The Report is most effectively illustrated by photographs of the men under training, at work and at play, and a particularly interesting feature are the brief extracts from the thousands of letters received at Headquarters from the men throughout the world telling of the happenings in their everyday lives, and all paying tribute to the difference St. Dunstan's has meant to them.

Full Accounts and Balance Sheets accompany the Report, a copy of which may be had by application to St. Dunstan's Headquarters, Inner Circle, Regent's Park, London, N.W.1.

"The Premier Horse-Breeding County."

The Claims of Pembrokeshire.

Col. Loch and Col. Hawkes, War Office representatives, attended a meeting of the Pembrokeshire Live Stock and Horse-Breeding Committee, held at the Shire Hall, Haverfordwest, last month, when some important remarks were made in regard to the position of Pembrokeshire as a horse-breeding county.

The committee have put forward a claim for three thoroughbred stallions for next season instead of the two hitherto allotted to the county by the War Office, who have now taken over from the Ministry of Agriculture the encouragement of horse-breeding.

Col. Loch remarked that the War Office were starved of money, being forced to make use of £80 where £100 was needed, and in regard to the question of an extra thoroughbred stallion, the committee had to remember that the War Office when adjusting claims from this and other counties had to take into consideration the fact that Pembrokeshire got help in other ways. It all meant that a good deal of money was being spent in the county. That being so, it was not as easy to give them an extra thoroughbred as if the roadster scheme was not in existence. They felt at the War Office that the roadster scheme was so important from the point of view of horse-breeding in Pembrokeshire that it ought not to be interfered with if it was possible to keep it on. They thought it was because they had this roadster blood in Pembrokeshire that they were able to produce the weight-carrying horse that was needed. There were very few short-legged weight-carrying horses in the country. The Pembrokeshire mares were about the only thing left that produced animals of this stamp, and unless they had a scheme to keep these mares going and retain the roadster strain, Pembrokeshire would soon be in the position of other counties that had lost their brood mares. They in Pembrokeshire had very nearly lost them as it was. He thought, however, they were now improving and that there were more of the old type of young brood mares about. He hoped the committee would be able to keep their roadster scheme intact and also get a third thoroughbred, but the question was whether the third thoroughbred was more important than subsidising the roadsters.

Mr. G. B. Bowen replied that he did not know that the third horse would be a sort of alternative to giving up their roadster scheme. Personally, he would be sorry to see the roadster scheme given up after all these years. It was in 1911 that Col. Lort Phillips started it—he thought successfully. He thought himself there was room for both in the county. There was no doubt that their horses had had plenty of mares and he thought they could do with a third. The light horse breeding possibly paid better than the heavy horse breeding. He was told that at the last United Counties' Hunters' Show at Carmarthen there were only three winners from Carmarthenshire, all the others being bred in Pembrokeshire. He was also told that people were so keen to get horses bred in Pembrokeshire that they were buying them quite young. He did not know the reason, but perhaps it was that owing to lack of labour the farmers' sons had not the time to "make" the colts as in the past. They used to be able to "make" the colts, but now they sold them off earlier. Returning to the question of the roadsters, Mr. Bowen said he thought the light horse breeding in Pembrokeshire was a very good proposition. The county was naturally adapted to it in every way, and the colts grew well there. He hoped the War Office would look upon Pembrokeshire as one of the premier counties, if not the premier county, for horse-breeding. It looked as though they would eventually have a mechanicalised army, but horses had advantages that no mechanical transport possessed, and as long as horses were used in the army the authorities would require horses and their production ought to be encouraged. He hoped the committee would not be asked to have a third thoroughbred horse as an alternative to the light horse scheme, but that they would have a third horse in the county next year.

Col. Loch said if it could possibly be done it would be done. He entirely agreed with what Mr. Bowen had said and he believed Mr. Bowen realised the position of Pembrokeshire as a horse-breeding county. It was only right, however, that he (Col. Loch) should tell them that on their roadster scheme the War Office spent £600 or £700 a year. That was really equivalent to a couple of extra stallions. Practically the county was now getting four stallions already and yet they were asking for a fifth. He was very glad to hear Mr. Bowen say it was absolutely necessary to go on encouraging the breeding of roadsters because it was his own opinion that the whole foundation of horse-breeding in Pembrokeshire was on the roadster scheme. He would go back to London and say he knew the members of the committee were all agreed that the roadster scheme should on no account be interfered with and that they all felt that there was room for a third horse if the War Office could find the money. He added that he hoped to be present at the next quarterly meeting and present a report.

R.C.V.S. Fellowship Diploma.

An examination for the Diploma of Fellow was held at 10 Red Lion Square, London, W.C.1, on Tuesday, December 20th, 1927, when the following candidate was successful:—

Arnold Worsley Holtum, B.V.Sc., D.V.H. Thesis entitled "A Double Intradermal Test for the Diagnosis of Bovine Contagious Abortion." Examiners: Mr. F. T. Harvey, F.R.C.V.S., and Dr. A. Leslie Sheater, D.Sc., M.R.C.V.S. Chairman, Mr. G. H. Livesey, M.R.C.V.S.

R.C.V.S. Obituary.

Wickham, John, Hassocks, Sussex. Graduated, London, 21st December, 1868. Died 3rd December, 1927, aged 79.

DIVISIONAL REPORT.

Western Counties Division.*

PRESIDENT'S ADDRESS AT PLYMOUTH.

There was a good attendance at the autumn meeting of the Western Counties' Division, held by invitation of Mr. and Mrs. P. W. Bloye at their residence, 44 Ebrington Street, Plymouth, on Wednesday, November 23rd.

The President (Mr. S. J. Motton, F.R.C.V.S.), presided. Other members present were :—Messrs. E. W. Bovett, C. Masson, H. Fraser, R. E. L. Penhale, W. N. Wright, H. W. Townson, W. Ascott, J. M. Penhale, E. R. Edwards, W. G. Blackwell, P. W. Bloye, L. Norman, A. H. Oliver, R. Barons Nelder (Honorary Secretary). *Visitor.*—Mr. W. J. Radford.

The minutes of the previous meeting were taken as read, and were signed as correct.

Correspondence.—(1) Apologies for absence were read from Professor F. T. G. Hobday, Messrs. E. C. Bovett, R. W. Cassells, C. Crowhurst, J. Dunstan, J. Cochrane Dyet, J. Forbes, F. T. Harvey, W. B. Nelder, R. H. Penhale, W. Roach, G. A. Roberts, H. K. Roberts, A. G. Saunders, R. H. Smythe and E. R. Smythe.

(2) A letter from Dr. A. Leslie Sheather was read by the Hon. Secretary, who was given instructions as to the terms of his reply.

New Members.—Mr. R. W. Cassels, M.R.C.V.S., Honiton, and Mr. E. G. Conisbee, M.R.C.V.S., Axminster, were elected members on the proposition of Mr. C. Masson, seconded by Mr. E. R. Edwards. Mr. W. J. Radford, of Mutley-plain, Plymouth, was nominated for membership.

PRESIDENTIAL ADDRESS.

The PRESIDENT (Mr. S. J. MOTTON) then gave his address from the Chair, as follows :—

Twenty-four or twenty-five years ago, had I attempted to visualize the President of a Veterinary Medical Association, my youthful conception of such a person would probably have been that of an old fellow, with head devoid of hair, his face disfigured by spectacles, and possibly the possessor of one or more flat feet. To-day, I find myself qualified by at least three of these conditions, and thanks to your choice, I am President of this Association. Any twinge experienced by me in connection with the qualifications to which reference has been made, is far out-weighed by the pleasure your selection has given me, and will you please accept my assurance that any duties which may devolve upon me in connection with the office, will be carried out to the best of my ability. At the same time, you have the gratifying knowledge that the able hand which wields the honorary secretary's pen will always be available to hold mine, and to lead me along the correct path.

Originality in a presidential address is very difficult of attainment, and I fear I must largely forego the desire to strike new notes in mine. As most of us practice with some idea of not being worse off at the end of the year than at the beginning, we may be forgiven for wondering what the future holds for us. In this connection, it has been said that when one door shuts another opens. There is no doubt some truth in this remark, but it is open to debate as to whether the new door always opens on to as desirable a pitch as the other one closed upon. Public appointments, and those connected with research, have considerably increased in numbers in the last few years, but the market for home qualifications for over-seas appointments will contract as the colonies increase the number of their own graduates. The man, or woman, who intends to engage in private practice at home has many points to consider. In the last twenty-five years we have watched with concern the rapid disappearance of the horse from our streets, although it must be confessed that no lover of a horse can view with tranquillity his frantic efforts to maintain his balance and draw a load on present-day road surfaces. Hunting and racing will no doubt continue for a long time. This is probably especially true in connection with racing, which has the stimulus added by betting. I imagine the selling and breaking up of large estates will, as time goes on, limit the amount of hunting, and so possibly also will the influence of the apparently increasing number of people who object to blood sports. Added to these may be a number of people who can afford to keep a hunter or a car, but not both. They will often decide on a car. It is true that horses have come back in certain districts and for certain work, but we find, in the Agricultural Statistics for 1926, that the total number of horses on agricultural holdings in England and Wales, was 1,128,000, a decrease of over 35,000 from the previous year. The number of foals in the same year was 3,000 less than the previous year. The reduction in the number of foals in the previous three years had already been 10,000, 11,500 and 17,500 respectively. I think it is certain that the veterinary surgeons of to-morrow must not look much to horses as prospective patients. He would indeed be an optimist who could persuade himself that the mechanical genius of those connected with the motor industry will permanently fail to invent some form of machine capable of taking the place of the horses which have come back, and many of those which have hitherto resisted serious opposition from mechanical transport.

Sheep are on the increase again, but in 1926 they were still 400,000 below the 1914 level.

Pigs showed a decrease of over 400,000 as compared with 1925. Poultry have steadily increased in numbers since 1921. We must pay increasing attention to pigs, sheep and poultry, and we should not over-look the possibilities, in a smaller way, of rabbits, pigeons and cage birds. Bovine practice, however, appears to offer the largest permanent excuse for our existence, but the greatly increasing interest which is being evinced in dogs and cats makes them a most important consideration, and one deserving our very serious attention.

Turning back to cattle, we find there were 736,000 more of these animals in England and Wales in 1926 than there were in 1921. The increase in the dairy herd to 2,749,000 represented in increase of 36,000 over the previous year. The increase in numbers probably represents an addition to our revenue from this source, but the addition does not necessarily mean a proportionate increase, for it does not

* Received on 13th December.

follow that the increase in the number of cattle carries with it a proportionate augmentation of capital value. Probably the increase in the dairy herd will receive a check, for I think the supply of liquid milk exceeds the demand.

Referring to dogs, it is of interest to note that the number of dog licences issued in the year ending March 31st, 1927 was 2,865,367, an increase of considerably over one million as compared with the year ending March 31st, 1920. In connection with registered dogs, I am indebted to the Secretary of the Kennel Club for information to the effect that the average number of dogs registered before the war was 18,000 annually. This year the number will reach nearly 60,000. There are no figures available, as far as one knows, in relation to the number of cats, but if the number of voices heard in the nightly congresses in my garden are any guide, then it is safe to assume that these animals are not decreasing in number.

If you will permit me, I will ramble on for a further few minutes. The question of the eradication of bovine tuberculosis still remains to be seriously handled. When it is dealt with we shall no doubt find a good deal of work waiting for us. When it *has been* dealt with, and the number of tuberculous cattle has been reduced to a minimum, the healthier herds which will then exist will provide less work for us. My experience of tubercle-free herds is that, apart from the periodic testing cost, the veterinary bill is materially reduced. It remains to be seen whether the system adopted will be on the lines practised in America, *viz.*, tuberculin testing and elimination of reactors, or a system of vaccination as suggested by the Calmette school. If the latter, then in the transition stage there will be some difficulties cropping up in connection with private tuberculin testing; that is, if I am correct in assuming that a vaccinated animal will react to the tuberculin test for anything up to twelve months. From the standpoint of the farmer, in the South-West of England at any rate, Johne's disease is about as serious as tuberculosis in respect of the appreciable losses it occasions. In the working of the Tuberculosis Order, one often wonders if this disease could not have been dealt with simultaneously with cases of tuberculous emaciation. The value of the affected animals is small. They are not worth the cost of the tuberculin test which is not infrequently necessary to differentiate between the two diseases. If we could slaughter such animals as a result of the first inspection without differentiating between tuberculosis and Johne's disease, the cost of testing would be avoided, and the money could be employed to help in the elimination of the two diseases at the same time. It is to be hoped that the early favourable reports concerning Dunkin's "Tepsin" will be confirmed, as they promise to be. We shall then be able to help owners to escape some of their losses from Johne's disease. The discovery of a successful line of treatment would be a god-send.

The recent flame of interest as to the cause of milk fever in cows is to be welcomed, and it is to be hoped that a workable form of treatment other than by way of the udder will be discovered, or, better still, a reliable means of prevention.

The high degree of milk production which appears to be essential to modern dairy farming gives rise to the need for extra knowledge in connection with the feeding of cows. It is a matter for consideration as to whether milk production is not being carried a peg too far. We may wonder if the extra milk yield obtained by modern methods always more than balances the extra cost of food, and the wastage in the cows themselves.

The question of compulsory pupilage for veterinary students was recently the subject of an article by Professor Hobday. It is not a new question, but it has lost none of its importance. The proportion of students who have seen practice before they qualify appears not to increase. There are difficulties in the way of providing for such pupilage, but I think the question would settle itself if it were understood that no one could walk about with our diploma under his (or her) arm until at least twelve months of mixed practice had been seen.

In conclusion, in order to discharge our duties to our clients or employers we must keep abreast of the times. We must be ready to adopt new methods of treatment as they become available, but we must avoid "stunting." In medicine and surgery, both human and veterinary, there is often observable a tendency to "stunt," and too great a hurry to accept things as facts before they have been properly tried out. The ill-considered use of any kind of treatment may lead to accident or disappointment, and to the possible throwing over of methods which may be very useful in their proper places. This has been noticeable in reports on the use of vaccines, vitamines, electro-therapy and gland extracts, among other things. In practice, as in the laboratory, control cases must be considered. I will impose on you for one minute more. You are entitled to know that this Association was recently represented in London at the meeting of the Council of the "National," by Messrs. Masson and Nelder, and myself, when the first arrangements for next year's Congress at Newcastle were dealt with.

In case the rush for trains later makes it difficult, may I take this opportunity (while we are all here) of asking Mr. and Mrs. Bloye to accept for their kind hospitality and for the use of their house for this meeting, an expression of our most sincere thanks.

The President was cordially thanked for his address, by Mr. W. Ascott, who said the association owed Mr. Motton a debt of gratitude and also for representing them at the National Association meeting.

Other Business. In the course of a discussion as to the advisability of forming a Veterinary Inspectors' section in the Division, letters were read from Mr. Harvey (St. Columb) and Major J. Cochrane Dyet (Wiveliscombe).

Mr. W. G. Blackwell inquired if there were any veterinary inspectors who were not members of the Division.

The Hon. Secretary replied that there were practically none, except in Somerset, which the Western Counties' Division did not entirely cover.

Mr. C. Masson thought the Division had done very successfully in the past without an inspectors' section, by the present arrangements.

Mr. W. Ascott expressed the view that it would seem to be duplicating work for the Secretary if such a section was formed. He did not see any object in forming a separate association, but, as an association, they should join those who wanted to form one.

Mr. H. W. TOWNSON considered if it was necessary to have an inspectors association it might be a help to have three—one for each of the Western Counties under the parent body of the Western Counties Division.

Mr. E. R. EDWARDS pointed out that so often as associations were multiplied, existing ones were weakened.

Mr. E. W. BOVETT thought the existing arrangements seemed satisfactory, and on the motion of Mr. EDWARDS, seconded by Mr. R. E. L. PENHALE, it was decided to reply to the National Association's letter that, as the Western Counties' Division was practically a veterinary inspectors' section, it was not necessary to form a separate association in that part of the country.

The President then called upon Mr. J. M. L. PENHALE, Ministry of Agriculture and Fisheries, to read his paper, "Some Remarks on Foot-and-Mouth Disease."

[Mr. Penhale's paper, and the ensuing discussion, are reproduced elsewhere in the present issue.—Ed.].

Members were unanimous in expressing their congratulations to Mr. Penhale for his extremely interesting paper, and a vote of thanks was carried with acclamation.

At the conclusion of this portion of the proceedings, several members brought up various cases and matters about which they sought advice, and very interesting discussions resulted.

The meeting concluded with a vote of thanks to the President for his conduct in the Chair.

The members were subsequently entertained to a sumptuous tea by Mr. and Mrs. P. W. Bloye, who were with acclamation accorded a very hearty vote of thanks for their kind hospitality, on the proposition of the President, seconded by Mr. R. E. L. Penhale.

Mr. and Mrs. Bloye both suitably replied.

R. BARONS NELDER, *Hon. Secretary.*

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

1928.

Jan. 1st—N.V.M.A. SUBSCRIPTIONS DUE.
Jan. 2nd—N.V.M.A. Editorial Committee, 4-30 p.m.
Jan. 9th—N.V.M.A. Finance Committee, 4 p.m.; Editorial Committee, 4-30 p.m.
Jan. 10th—N.V.M.A. Committee Meetings.
Jan. 11th—N.V.M.A. Council Meeting.
Jan. 11th, 12th, and 13th—R.C.V.S. Committee and Council Meetings.

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As will be noted from the above Diary of Events, a departure from precedent has been arranged in connection with the holding of the forthcoming meetings of the N.V.M.A. Council and Committees.

The fixing of the Committee meetings for the afternoon of Tuesday, January 10th, and of the Council meeting for that of the following day has been determined upon in order that a full attendance of members may be secured, it being felt that were the Committee meetings to be held, as heretofore, on the morning of the Council meeting day, attendances would suffer by reason of the fact that there would be a simultaneous meeting of the Registration Committee of the R.C.V.S., comprising the whole Council of that body.

We trust that this temporary arrangement will not unduly inconvenience members concerned, and will be productive of satisfactory attendances at the N.V.M.A. meetings.

FOOT-AND-MOUTH DISEASE.

At the commencement of the week the following announcement was made by the Ministry of Agriculture:—

"The occurrence of a large number of new outbreaks of foot-and-mouth disease among cattle in the Midlands is giving cause for considerable anxiety. The first of the series was discovered in the public abattoir, Birmingham, on December 10th, infection having probably been carried there from Wiltshire. On December 12th, disease was discovered in the City Pig Market, Birmingham.

"New centres of disease have subsequently appeared at Lymm, Cheshire, on December 16th; at Werrington, Stoke-on-Trent, Staffordshire, on December 20th; at Whiston, near Rotherham, in the West Riding of Yorkshire, Sutton-on-the-Hill, Derbyshire, on December 23rd; and at Grimsby, Lincolnshire, on December 25th. These six widely distributed centres of disease have given rise to date to twenty-six outbreaks. It is clear from inquiries which have been made that Derby Market of December 16th and probably that market of December 13th were infected with disease. It is probable that the following markets were also infected:—Leek, Staffordshire, December 14th; Ashbourne, Derbyshire, December 15th; and Bakewell, Derbyshire, December 19th.

"In view of the very uncertain position the Ministry has, in addition to the usual infected area restrictions round the actual diseased farms, declared a standstill area comprising the whole of the counties of Derby, Stafford, Leicester, Warwick, Worcester, Nottingham, and Lincoln (all three divisions), and also parts of the counties of Lancashire, Yorkshire West Riding, Yorkshire East Riding, Shropshire, Cheshire, Gloucester, and Flint. No movements of cattle, sheep, pigs, or goats can take place in the standstill area without a licence from an inspector of the local authority."

CATTLE "BLINKING" BELIEFS IN TYRONE.

Extraordinary evidence was given in a crowded court at Dungannon Quarter Sessions, before His Honour Judge Linehan, in a slander action, which she won, brought by a woman who was alleged to have "blinked" cattle. Witnesses stated that, to dispel the evil, thatch was burned at the cows' noses and red rags tied to their tails to keep away the witchcraft.

Mr. Skeffington, in opening the case, said these writs were brought by the plaintiff, Elizabeth Hazelton, of Drumcrow, against the defendants, William Blair, of Drumcrow and Isaac and Sarah M'Farland, of Drumhorrick. The issue in the case was whether the plaintiff had the evil eye. Plaintiff's case was that the power to blink did not exist. Defendants' case, as far as he knew, was that certain persons had the power to "blink," or bewitch cattle, even at a distance, but that they never said it was the plaintiff.

Plaintiff, a well-dressed woman, said in her district a number of people believed in the power to "blink" cattle, and rumours had got out in the district that she had that power. She knew the defendants' cattle had been failing in milk supply, but she had nothing to do with that. In consequence of stories circulated she and her husband visited William Blair on 19th April last. Her husband

asked Blair what slanderous statements he had been making about witness. Blair said that the statements were true, for the thatch of his house had cured the cattle, thank goodness. (Laughter.) Blair added that burning the thatch was one of the recognised cures for "blinked" cattle, and said he had burned it under the cow's nose, and the cow had jumped to her feet and got better. After the cows were cured the defendants protected the animals by tying a red rag on their tails. (Laughter.)

Robert M'Kitterick, Cormullagh, a feeble old man, said he possessed the cure for "blinking" and people came to him from all parts of the country to have their cattle cured of the "blink." The defendants, who lived a considerable distance away, came to him to get the cure, and they asked whether he could tell who was "blinking" their cattle. He said he could not, and the defendants said they blamed a woman.

He cured the "blink" by the use of salt in the name of God, and he had told the defendants the way to use the salt.

His Honour said the defamation relied on was outlandish and highly improbable, but none the less serious, namely, the imputation that the plaintiff possessed power to affect the condition of a neighbour's cattle by "blinking" them. It was fairly obvious that the imputation was broadcasted that the practice of "blinking" was attributable to some persons. If he (his Honour) found that the defendants or one of them uttered words suggesting that the plaintiff possessed these powers they would be made answerable for the accusation. He held that the uttering of a gross scandal by Blair had been proved, and that no justification had been offered. In this instance privilege did not arise, and he awarded sufficient damages to clear the character of the plaintiff, and assessed the amount at £5 and costs. He dismissed the cases against Isaac and Sarah M'Farland. —*Belfast Telegraph.*

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

"Follicular Mange."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I recently sent you the report of a case of a Fox-terrier dog which suffered from follicular mange and was successfully treated with "Odylen" in conjunction with "Aricyl."

It is now over three months since the course of treatment was completed and my client writes me as follows:—

"When my dog was first taken to you, suffering from a skin disease, he was in a most deplorable state and I had previously been told that his condition was practically hopeless. He is to-day in the very best of health and without a blemish of any sort on his skin." Yours faithfully, J. C. JACKSON.

97 Highgate Road, London, N.W.5.
22*nd December*, 1927.

The Editor acknowledges the receipt of the following:—

Report of a meeting of the Scottish Branch N.V.M.A., from Mr. W. C. Miller, Hon. Secretary.

Communications from Messrs. D. Imrie and R. R. Moody.

Victoria Veterinary Benevolent Fund.

Founded 1897. Incorporated 1919.

Bankers: BARCLAYS BANK LTD., HENRIETTA STREET, COVENT GARDEN, W.C.

The Fund is incorporated under the Companies Acts, 1908-1917. It is managed by a Council consisting of representative members of the Profession.

Objects:

"The gratuitous relief, by means of pecuniary or other assistance, of necessitous and deserving members of the Royal College of Veterinary Surgeons, whether subscribers to the Fund or not, and of the necessitous and deserving widows and relations of deceased members of the Royal College of Veterinary Surgeons."

Forty necessitous persons are being assisted at a total annual cost of over £1,000.

Minimum Annual Subscription ... 10s. 6d.
Life Membership Subscription ... £10 10s.

Subscriptions, Donations and Legacies are earnestly solicited.

Remittances payable to the "Victoria Veterinary Benevolent Fund," and crossed, should be sent to the Secretary, at the Registered Offices, 10 Red Lion Square, London, W.C.1.